THE BEAUTIES OF NATURE and ART DISPLAYED, IN A TOUR through the WORLD;

CONTAINING,

I. A General Account of all the Countries in the World, remarkable for either Natural or Artificial Curioſities; their Situation, Boundaries, Extent and Diviſions; their Rivers, Air, Soils, Chief Cities, &c.

II. A particular Account of the moſt curious natural Productions of each Country, in the Animal, Vegetable, and Foſſil Kingdoms; of remarkable Mountains, Caverns, and Volcano's; of Medicinal and other ſingular Springs; of Cataracts, Whirlpools, &c.

III. An Hiſtorical Account of the moſt remarkable Earthquakes, Inundations, Fires, Epidemic Diſeaſes, and other public Calamities, which have, at different times, viſited the Inhabitants.

IV. Extraordinary Inſtances of Longevity, Fertility, &c. among the Inhabitants; together with an Account of their moſt celebrated Inventions, Diſcoveries, &c.

V. Particular Deſcriptions of the moſt remarkable Public Buildings, and other ſingular Productions of Art.

VI. Curious Remains of Antiquity; remarkable Laws, Cuſtoms, and Traditions of the Inhabitants; together with a Summary View of the moſt extraordinary Revolutions among them.

Illuſtrated and embelliſhed with Copper Plates.

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THE BEAUTIES OF NATURE AND ART DISPLAYED; IN A TOUR through the WORLD.

CHAP. V. *Continued.*

SECT. VI.

Curious Remains of Antiquity in Germany, Bohemia, Hungary, *and* Switzerland; *remarkable Laws, Cuſtoms and Traditions of the Inhabitants; with a ſummary View of the moſt extraordinary Revolutions amongſt them.*

REMAINS *of* ANTIQUITY, REMARKABLE LAWS, CUSTOMS, *and* TRADITIONS.

THE town of Naſſau in the Wetteraw in Germany was, in the time of the Romans, a conſiderable city, as appears from ſeveral remains of Roman highways in the neighbourhood ſtill viſible, with cirques, aqueducts, triumphal arches, and other monuments of Roman grandeur.

About fives miles from Nyon, in the canton of Bern in Switzerland, are ſtill viſible the ruins of a wall, built by Julius Cæſar, to prevent the Swiſs from penetrating into Gaul. It reached eighteen miles, from mount Jura to the lake, according to Cæſar's own account, in the firſt book of his *Commentaries*; and at Yverdun, in the ſame canton, have been found medals of all the Roman Emperors, from Auguſtus to Julian the Apoſtate, with many other monuments of antiquity.

At Avenches, in the canton of Bern, have been found Roman coins, and many other remains of Roman antiquity, particularly the ruins of a magnificent amphitheatre, together with thoſe of towers, walls, and other buildings.

In Baden, in the canton of the ſame name, is a ſtone pillar, with a Roman inſcription, in memory of a ſtone cauſeway, built by the Emperor Trajan, through this country, of about eighty miles in length, ſome remains of which are ſtill viſible; and at Zurzach, in the ſame canton, are the ruins of an antient fortreſs, ſuppoſed to have been one of the forty which Druſus erected along the banks of the Rhine: here have been found ſeveral Roman coins and medals; and at Wettingen, not far from this place, an earthen pot was dug up, in 1633, full of ſilver medals of the Roman Emperors, together with ſome ſilver veſſels, which are conjectured, from an inſcription on a ſtone of the ſteeple of the abbey church here, to have been uſed in a temple which formerly ſtood in this place dedicated to the goddeſs Iſis.

In a chapel belonging to the church of Mortigny, in Valais, are three antique columns, and a moſaic pavement, together with ſeveral Roman inſcriptions; at Geneva is an antient tower, which bears the name of Julius Cæſar, by whom it is ſuppoſed to have been built; and in the lake, at this place, is a great ſtone called Neyton, or Nitton, which in the time of the Romans ſerved as an altar on which ſacrifices were offered to Neptune, and other deities of the waters; and not many years ago, knives and other inſtruments of ſacrifice were found here all of braſs.

In a church in the city of Prague is a charter, which is ſaid to be the original charter of Alexander the Great; this, if genuine, muſt be the moſt antient record in Europe, of which the following is a tranſlation:

'We Alexander the Great, ſon of King 'Philip, founder of the Grecian empire, go'vernour of the Perſians, Medes, &c. and of 'the whole world from eaſt to weſt, and from 'north to ſouth, ſon of great Jupiter, by &c. 'ſo called, to you the noble ſtock of Slavo'nians, and your lineage, becauſe you have 'been unto us a help, true in faith, and va'liant in war. We confirm all that tract of 'earth, from the north to the ſouth of Italy, 'from us and our ſucceſſors, to you and your

'poſterity

‘ poſterity for ever: and if any other nation
‘ be found there, let them be your ſlaves.
‘ Dated at Alexandria, the 12th of the goddeſs
‘ Minerva. Witneſs Ethra, and the eleven
‘ princes whom we appoint our ſucceſſors.’

Of the famous Golden Bull, edict, or imperial conſtitution, made by the Emperor Charles the Fourth, there are three originals, one of which is preſerved at Prague, one at Nuremberg, and the third in an apartment in the town-houſe of Franckfort, which is never ſhewn to ſtrangers, but in preſence of two of the council and the ſecretary. It is a little Latin manuſcript in quarto, conſiſting of forty-two leaves of parchment. This is reputed to be the magna charta, or the fundamental law of the German empire. It is called *golden*, becauſe it has a golden ſeal, in the form of a Pope's bull, tied with yellow and red cords of ſilk; upon one ſide is the Emperor repreſented ſitting on his throne, and on the other the Capitol of Rome. It is alſo called Caroline, on Charles the Fourth's account. Till the publication of the Golden Bull, the form and ceremony of the election of an Emperor were dubious and undetermined, and the number of the electors not fixed. This ſolemn edict regulated the functions, rights, privileges, and preeminences of the electors. This ordinance, containing thirty articles, or chapters, was approved of by all the princes of the empire, and remains ſtill in force.

In a long narrow chapel of the cathedral church at Franckfort, called the Conclave, the Emperor is choſen; and in another chapel of the ſame church, he is crowned. After the election is over, the Emperor and Electors meet in the town-houſe of Franckfort, where is a great hall, in which the imperial feaſt is kept on the coronation day. Before the houſe is a great ſquare, where, at this ſolemnity, an ox is roaſted, ſtuffed with veniſon, wild fowl, and ſucking pigs; and thither one of the Electors comes in perſon for a ſlice of beef, which he carries to the Emperor's table, after which the ox is abandoned to the populace. Another of the Electors carries his Imperial Majeſty a glaſs of wine, which, on that occaſion, runs from a fountain in the middle of the ſquare. A third Elector carries his Majeſty a meaſure of oats; and in this ſquare, after the coronation, another Elector diſtributes the medals ſtruck upon the occaſion.

The city of Nuremberg, in Franconia, has the cuſtody of moſt of the imperial ornaments made uſe of at the Emperor's coronation, as 1. Charlemagne's crown, which weighs fourteen pounds, and about which there is a mitre, enriched with a vaſt number of diamonds, rubies, emeralds, and pearls; and on the front a croſs of diamonds of great value. 2. Charlemagne's Dalmatic robe, or mantle, embroidered with large pearls. 3. The golden apple, or globe. 4. Charlemagne's ſword. 5. His golden ſceptre. 6. The imperial cloak, embroidered with eagles, and bordered with large emeralds, diamonds, ſapphires, and chryſolites. 7. The buſkins, covered with plates of gold. 8. The gloves, embroidered with curious ſtones. Theſe imperial ornaments are preſerved in the church of the hoſpital of this city, in which church is alſo a large cheſt, ſuſpended from the cieling by iron chains, and containing a vaſt many ſacred relics, ſhewn only to travellers of very great diſtinction.

In the cathedral church of Cologne are ſhewn the tombs of the three wiſe men who came to worſhip our Saviour, called from hence the Three Kings of Cologne, whoſe bones, it is pretended, were removed to Conſtantinople by Helena, the mother of Conſtantine; thence they were carried to Milan, by Euſtrophius, Biſhop of that See, and afterwards brought hither by Rainold, Biſhop of Cologne. The remains of the Three Kings of Cologne are depoſited in a large purple ſhrine, ſpotted with gold, ſet upon a pedeſtal of braſs, in the middle of a ſquare mauſoleum, faced both within and without with marble and jaſper. This ſhrine is opened every morning at nine o'clock, when theſe Kings are ſhewn lying at full length, their heads adorned each with a crown of gold, garniſhed with jewels. Their names, which are Gaſpar, Melchior, and Balthaſar, are in purple characters upon a little grate, which is adorned with a vaſt number of large rich pearls, and other jewels, particularly an oriental topaz as big as a pigeon's egg, valued at 30,000 crowns. Over againſt this ſhrine are ſix large branches of ſilver, with wax candles, which burn day and night.

One of the two pariſh churches of this city is dedicated to St. Urſula, who, it is ſaid, was martyred here, with eleven thouſand virgins, in the reign of the Roman Emperor Maximinianus; and the tomb of St. Urſula, together with the bones of the pretended virgin martyrs, are ſhewn here to this day. Some of the ſkulls of thoſe virgins, moſt noted for miracles, are kept in caſes of ſilver in this church; others are covered with ſtuffs of gold; and ſome have caps of cloth of gold and velvet.

In the town-houſe of Cologne, which is a large Gothic ſtructure, is depoſited a vaſt variety of antique arms, conſiſting of bows, arrows, bucklers, and the like, among which is a croſs bow of whale-bone, twelve feet long, eight inches broad, and four inches thick.

A favourite recreation of the Germans in winter is riding in ſledges, of which there are various ſorts, ſome open, and moved by ſprings; others, like the Roman triumphal chariots, drawn by a horſe, or ſome wild beaſt trained up to that ſervice, and adorned with ribbands, feathers and bells. The princes of Germany with their courts frequently uſe this paſtime, and run races with theſe machines on the ice and ſnow. But the moſt favourite recreation of the Germans is hunting, at which they are acknowledged to be the moſt expert in the world, particularly at boar hunting and bull hunting; and the princes of this country, after vaſt preparations of new liveries, rich field equipages, and ſylvan muſic, ſet out a hunting, with as numerous a retinue as if they were going to encounter a formidable enemy.

There is a diverſion, which is the common amuſement of the court of Vienna, and is deſcribed as follows by an Engliſh lady who was in a public character at this court in the year 1717. The Empreſs Amelia, being at her palace of retirement, about half a mile from Vienna, was ſeated on a little throne, at the end of a fine alley in her garden, and on each ſide of her were ranged two parties of her ladies of quality, headed by two young archducheſſes, all dreſſed in their hair full of jewels, with fine light guns in their hands; and at proper diſtances, were placed three oval pictures, which were the marks to be ſhot at. The firſt was that of Cupid filling a bumper of Burgundy, with the motto, ‘ 'Tis eaſy to be ‘ valiant here.’ The ſecond, a Fortune, holding a garland in her hand: the motto, ‘ For ‘ her whom Fortune favours.’ The third was a ſword, with a laurel wreath on the point: the motto, ‘ Here is no ſhame to the van‘ quiſhed.’ Near the Empreſs was a gilded trophy wreathed with flowers, and made of little crooks, on which were hung rich Turkiſh handkerchiefs, tippets, ribbons, laces, &c. for the ſmall prizes. The Empreſs gave the firſt with her own hand, which was a fine ruby ring, ſet round with diamonds in a gold ſnuff-box. There was for the ſecond a little Cupid, ſet with brilliants; and beſides theſe a ſet of fine China for the tea table, enchaſed in gold, Japan trunks, fans, and many galantries of the ſame nature. All the men of quality at Vienna were ſpectators; but the ladies only had permiſſion to ſhoot; and the Archducheſs Amelia carried off the firſt prize.

The Heydukes, or undiſciplined militia of Hungary, retain an antient kind of dance, called the Pyrrhical dance, with naked ſwords in their hands, brandiſhing them, and putting themſelves into a hundred terrible poſtures, advancing, retreating, turning, and winding about, with great activity, and ſinging all the time to their own meaſures.

The popiſh inhabitants of the biſhopric of Paderborn in Weſtphalia, at a certain ſeaſon of the year, aſſemble, each with a lighted taper, and go out with their prieſts at their heads, to the woods and groves, to viſit images, and ſacred relics, frequently placed there in little chapels, which are ſeldom or ever opened but upon theſe occaſions. The proceſſion is compoſed of a mixt multitude of both ſexes, and of all ages, who are generally out two or three days, and often lie promiſcuouſly in woods or barns.

The paſtoral life is ſo deſpiſed among the inhabitants of the circle of Swabia, that the meaneſt peaſant will not aſſociate with a ſhepherd. On the contrary, the profeſſion of hangman, in this circle, particularly in the duchy of Wirtemberg, inſtead of being infamous, is held in ſuch eſteem, that the common executioner is reckoned a fit companion for any gentleman; and is reſpected in proportion to the number of executions he has performed; and when theſe amount to a certain number, he is complimented with the degree of doctor of phyſic.

At St. Goar, in the country of Heſſe, is an iron collar, faſtened by a chain to a wall, the deſign of which is to impoſe upon travellers, who, the firſt time they paſs through this town, have the collar put round their neck, and are aſked, whether they chuſe to be baptiſed with wine or water? if they agree to be baptiſed with wine, they are ſuffered to paſs, by giving the executioners of this law ſomething to drink; if not, they are well drenched with water, which is thrown over them. After this ceremony, they preſent the ſtranger with wine in a ſilver goblet, which they ſay was given them by Chriſtiana, Queen of Sweden, as a ranſom from their baptiſm. It is ſaid that the Emperor Charles the Fifth gave the collar to the inhabitants with this whimſical privilege.

It is ſaid, that the citizens of Ratiſbon have a privilege of throwing into the Danube ſuch of their children as are incorrigible, without being accountable for it.

The method of extracting confeſſion from a criminal in Switzerland is, by tying his hands behind his back, pulling them up to his head, and drawing them about, till the arms and other parts are disjointed; if he confeſſes the crime charged upon him, and is condemned to die, he is obliged to renew the confeſſion upon oath, at the place of execution, where, if he recants, and pleads that his confeſſion was extorted from him, he is again put to the torture till he does confeſs, for without ſuch confeſſion no perſon can be executed.

The inhabitants in the city and neighbourhood of Mentz have a tradition, that Hatton the Second, Biſhop of this See, uſed to call the poor perſons who begged at his gate, the rats which eat up the corn; and that, in 969, this wicked prelate, having invited a great number of theſe poor wretches together, under pretence of giving them corn, ſhut them up in a barn, which he ordered to be ſet on fire, and had them all burnt; for which he was, by the juſt vengeance of heaven, ſo peſtered with rats and mice, that he was obliged to fly to a tower on a rock in the river Rhine, ſtill called the Mice-tower, where, notwithſtanding his retreat, he was followed by ſuch a vaſt number of rats and mice as ſoon devoured him.

It is ſaid, that no rat will live in the marquiſate of Anſpach, ſince one of the family of the rat-killing St. Hubert paſſed that way; and the inhabitants of this country are perſuaded, that juſt before any one of the family of Anſpach dies, the ghoſt of a woman dreſſed in white always appears in the palace.

It is ſaid, that in 1621, there was a battle fought between two large bodies of crows over the city of Troppaw in Sileſia, in which ſeveral hundreds of thoſe birds fell dead to the ground; and that extraordinary battle has been ſince looked upon, as a preſage of ſeveral ſucceſſive diſaſters that happened to this city ſome time afterwards.

On one of the pediments of the cathedral church of Lubeck is an inſcription in nine Latin diſtiches, intimating that the Emperor Charlemagne, having taken a ſtag alive in theſe parts, cauſed a collar of gold, with a croſs on it, to be put about his neck, inſcribed thus: *Hoc Cæſar me donabat*, with the date of the year; and then turned him looſe again into the foreſt; and that Leon, Duke of Saxony, having caught the ſame ſtag, four hundred years afterwards, with the collar about his neck, built and endowed a cathedral on the ſpot, and granted the biſhops a croſs or, in a field gules, for their arms; and as a monument of this fact, the figure of a ſtag is placed on the top of the church.

REVOLUTIONS *and other* MEMORABLE EVENTS.

THE etymology of the name *Germany* is very uncertain, and much controverted: nor is it more certain, when or by whom the country was firſt peopled. The earlieſt account we have of the inhabitants of this country is from Julius Cæſar, who relates, that the Germans, having croſſed the Rhine, under the command of Arioviſtus, one of their Kings, attacked the Gauls, then under the protection of the Romans; upon which Cæſar marched againſt them, drove them back over the Rhine, built a bridge a-croſs that river, and obtained ſeveral conſiderable victories over them.

Druſus, the adopted ſon of Auguſtus, ſubdued great part of Germany, which he reduced into a Roman province, and from that conqueſt obtained the title of *Germannicus:* but Quintilius Varus, having ſucceeded Druſus, loſt all that his predeceſſor had conquered; upon which the Rhine and the Danube became the boundaries of the Roman empire on that ſide, and to defend it againſt the incurſions of the Germans, Auguſtus placed forts and garriſons upon the banks of thoſe rivers.

But notwithſtanding theſe precautions, the Franks, Burgundians, Almans, and other German nations, broke through the Roman barriers, paſſed the Rhine, and diſpoſſeſſed the Romans of all Gaul, Rhoetia and Noricum, which they ſhared amongſt them: but the Franks, prevailing over the reſt, at length eſtabliſhed their empire over all Germany, France, and Italy, under the conduct of Charlemagne, who, in the year 800, was crowned Emperor of the weſt, as has been already related in the revolutions of France *.

From this period, the revolutions in Germany have alſo been exhibited among thoſe of France, till the death of the Emperor Lewis the Fourth, about the year 912, when the French line of Charlemagne ended in Germany, and the imperial dignity became elective †, as it continues to this day.

From the death of Lewis the Fourth, when the imperial dignity became elective, the dignities or great offices, which before had been only by commiſſions, were rendered hereditary, becauſe the empire had ceaſed to be ſuch; and the Electors were fixed at ſeven. Conrad, Duke of Franconia, was the firſt who was elected Emperor, after that dignity had been refuſed by Otho, Duke of Saxony, on account of his great age. His authority was not however acknowledged in Italy, where the Popes were grown powerful, and the government had been uſurped for above ſixty years before by

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* See Vol. V. p. 53. *& ſeq.*

† *Ibid.* p. 73.

petty tyrants. The Emperor Conrad dying in the year 920, Henry, ſurnamed the Fowler, the ſon of that Otho who refuſed the imperial dignity, was elected Emperor. The imperial dignity continued in the line of Henry the Fowler, till the death of his great grandſon Otho the Third, in the year 1002, when Henry, Duke of Bavaria, was choſen Emperor. This prince was ſucceſsful in his wars againſt the Saracens, whom he drove out of Apulia and Calabria in Italy, and he vanquiſhed the Wendiſh forces, who had over-run great part of Germany.

In 1024, upon the death of Henry of Bavaria, Conrad, a prince deſcended from Charlemagne, ſucceeded to the empire, and was ſucceeded by his ſon Henry, whoſe ſon Henry, an infant of ſix years of age, was choſen Emperor, in 1056, by the name of Henry the Fourth: but Pope Gregory the Seventh, refuſing to acknowledge him for his ſovereign, ſet up Rodolph, Duke of Swabia, againſt him; and though Rodolph was defeated, and killed in battle, the Pope ſo managed matters, that he procured Henry to be depoſed by his ſubjects, who elected his ſon in his ſtead, after he had reigned fifty years, and fought ſixty-two general battles; and before he died, this unhappy prince was reduced to ſuch difficulties, that he begged a prebendary in the church of Spire, which he himſelf had founded, but was refuſed it by the biſhop.

Henry the Fifth, the ſon of Henry the Fourth, was obliged to acknowledge the Pope's ſupremacy, and renounce all pretenſions to the inveſtiture of biſhoprics, which his predeceſſors claimed, even to that of the pontificate itſelf: this prince dying without iſſue, in 1125, was ſucceeded by Lotharius, Duke of Saxony, who received his crown from the Pope, and upon whoſe death, in 1138, his ſiſter's ſon Conrad, Duke of Swabia, mounted the imperial throne. He was ſucceeded by his ſon Frederick, who, from his red beard, was ſurnamed Barbaroſſa. This Emperor was crowned by Pope Adrian, but during the papacy of Pope Alexander the Third, he was excommunicated for oppoſing ſome encroachments of that ſee; and was ſo humbled, that he ſubmitted to throw himſelf at the Pope's feet, and ſuffer him to tread on his neck. In the year 1187, the Emperor Frederick, Richard the Firſt, King of England, and Philip the Second, King of France, went all three on an expedition to the Holy Land, where the Emperor was drowned in a river, as he was bathing. He was buried at Tyre, and was ſucceeded by his ſon Henry, who alſo died upon an expedition to the Holy Land, which the Pope had prevailed upon him to undertake.

Philip, the brother of Henry the Sixth, ſucceeded to the imperial throne, in 1190; but was excommunicated for refuſing to acknowledge the Pope's ſupremacy, and Otho, Duke of Brunſwick, was ſet up againſt him by the

Pope and the greateſt part of the Electors. By theſe competitors the whole empire was engaged in a bloody war, which continued till Philip was treacherouſly aſſaſſinated in the year 1208, when he left Otho in peaceable poſſeſſion of the empire: but Otho had not reigned four years, before he was depoſed by the Pope and the Electors, and Frederick, King of Sicily, advanced to the imperial dignity by the name of Frederick the Second.

Frederick the Second, who is greatly celebrated by hiſtorians for his learning, wiſdom, and reſolution, was five times excommunicated by the Popes, but prevailed ſo far againſt Pope Gregory the Ninth, as to depoſe him from the papal chair: theſe continual conteſts between the Pope and the Emperor gave riſe to thoſe two famous factions of Guelphs and Gibellines, the former adhering to the Pope, and the latter to the Emperors. Upon the death of Frederick, who reigned eight and thirty years, there ſtarted up no leſs than ſix competitors for the imperial dignity, which occaſioned an interregnum of great confuſion, for upwards of twenty years. The competitors were Conrad, the ſecond ſon of Frederick, who was elected King of the Romans, but was poiſoned by his phyſicians three years after he had aſſumed the title of Emperor; Henry, Landgrave of Heſſe, who was killed at the ſiege of Ulm; Manfred; William, Earl of Holland, declared King of the Romans by the Pope, in oppoſition to the Emperor Frederick the Second, but afterwards aſſaſſinated; Alphonſus, King of Caſtile; and Richard, Earl of Cornwall, brother to Henry the Third of England. At length, in the year 1273, Rodolph, Earl of Hapſburg, was choſen Emperor, and confirmed by the Pope. This prince firſt raiſed the Auſtrian family, by creating his ſon Albert Archduke of Auſtria, who was afterwards elected Emperor.

Upon the death of the Emperor Rodolph, in 1292, Adolph, Earl of Naſſau, ſucceeded to the imperial throne: but ſerving with his troops as mercenaries in the army of Edward the Firſt of England againſt France, he ſo diſguſted the Electors, that they made choice of Albert, Archduke of Auſtria, ſon of the Emperor Rodolph, for their ſovereign, who defeated Adolph in a pitched battle, and killed him with his own hand, in the year 1298. Albert made his ſon Rodolph King of Bohemia, and attempted to reduce Hungary, but was aſſaſſinated in 1308, when Henry, Earl of Luxemburg, was elected Emperor. This prince is celebrated for his wiſdom, valour and piety, but was, after a reign of ten years, poiſoned by a Franciſcan monk, with the conſecrated elements; upon which Ludowick, Duke of Bavaria, after an interregnum of ſome years, was raiſed to the imperial throne: Frederick, Duke of Auſtria, ſon of the late Emperor Albert, was ſet up by an oppoſite faction, but defeated by Ludowick, who conſtantly oppoſed the papal encroachments, depoſed Pope John the Twenty-ſecond,

and

and raiſed Nicholas the Fifth to the pontificate.

Upon the death of Ludowick, in 1346, Charles, the ſon of John, King of Bohemia, was elected emperor, by the name of Charles the Fourth, and was ſucceeded by his ſon Wenceſlaus in 1378, who being a diſſolute cruel prince, was depoſed, after a reign of twenty-two years, and ſucceeded by Frederick, Duke of Brunſwick, who was aſſaſſinated by Henry, Count of Waldeck, as he returned from the place of election, in the year 1400.

Upon the aſſaſſination of Frederick Duke of Brunſwick, Rupert, Elector Palatine of the Rhine, was choſen emperor; and, after a reign of ten years, was ſucceeded by Jodock, Marquis of Moravia, nephew to the Emperor Charles the Fourth: this prince reigned but nine months, and was ſucceeded by Sigiſmund King of Hungary and Bohemia, and brother to the Emperor Wenceſlaus. Sigiſmund, dying in 1440, was ſucceeded by his ſon-in-law, Frederick, Duke of Auſtria, who reigned fifty-three years, and whoſe poſterity had the addreſs to continue the empire in their family for 300 years, till the year 1740, when they loſt it, for want of iſſue male. Maximilian having been elected King of the Romans, in 1486, ſucceeded his father Frederick the Third, in 1493, and married Mary the daughter and heireſs of Charles Duke of Burgundy, by which match all the territories belonging to that duke, were transferred to the houſe of Auſtria.

Charles the Fifth, afterwards ſurnamed the Great, ſon to Philip King of Spain, and grandſon to Maximilian, was elected emperor in 1519. He procured Luther's doctrines to be condemned, but did not meddle with his perſon; and it was in this reign, that the diſciples of Luther obtained the name of Proteſtants, from their *proteſting* againſt a decree of the Imperial Diet in favour of the catholics. A ſhort view of the hiſtory of Charles the Fifth, has been delivered already among the monarchs of Spain *.

In 1558, Ferdinand the Firſt ſucceeded his brother Charles the Fifth in the empire; and, in 1564, was ſucceeded by his ſon Maximilian the Second, at that time King of Bohemia, and afterwards King of Hungary. In 1576, Rodolph ſucceeded his father Maximilian in the empire; and, in 1612, was ſucceeded by his brother Matthias, who made war upon the proteſtants in Bohemia, but dying without iſſue, in 1619, Ferdinand of Gratz, Archduke of Auſtria, and grandſon to Ferdinand the Firſt, was elected emperor. Upon the acceſſion of this prince to the Imperial throne, the States of Bohemia apprehending that he would be as ſevere upon the Proteſtants as his predeceſſor had been, offered the Crown of Bohemia to Frederick the Fifth, Count Palatine of the Rhine, which ſo incenſed the emperor, that he determined upon the deſtruction of the Proteſtants. This kindled a bloody war in Germany, which laſted near thirty years, and was terminated by the treaty of Weſtphalia, in the ſucceeding reign, by which the Proteſtants were ſecured in their religious and civil rights.

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* See Vol. VI. p. 94.

In 1637, Ferdinand the Third ſucceeded his father Ferdinand the Second, having been elected King of the Romans the preceding year. He carried on the war which his father had commenced, obtained a complete victory over the Proteſtants at Ratiſbon, and broke the power of the Swedes, who had been long victorious in Germany: but being afterwards deſerted by moſt of the princes of the empire, he was obliged to ſign the treaty of Weſtphalia. In the year 1653, he procured his eldeſt ſon Ferdinand to be elected and crowned King of the Romans, but this young prince died the year following.

In 1658, Leopold, the only ſurviving ſon of Ferdinand the Third, ſucceeded his father in the empire, and entered into a confederacy with Denmark, Brandenburg, and Poland, againſt Charles Guſtavus, King of Sweden, who was become very formidable to the German princes; having, in a great meaſure, conquered Poland, and made a conſiderable progreſs in the north of Germany; and the war was carried on with different ſucceſſes, till the peace of Oliva, in 1660. In the year 1663, the Emperor, entering into a war with the Grand Signior, loſt the greateſt part of Hungary; the Hungarian Proteſtants uniting their forces with the Turks, who, in 1683, laid ſiege to Vienna, the capital of the empire, and were upon the point of taking it, when John Sobieſki, King of Poland, came to its relief; and joining the Duke of Lorrain, the Imperial General, they attacked the beſiegers in their trenches, and entirely defeated them. From this time, the Turks, loſing ground every campaign, were at length, in 1688, driven entirely out of Hungary. But the French, in the mean time, invaded the empire on the ſide of the Rhine, and burnt and plundered the palatinate in a very terrible manner; upon which the Emperor and the Empire, Great Britain, the Dutch, and the Northern Powers, entered into a confederacy againſt France the year following. The war, however, continuing between the Imperialiſts and the Turks, and the Hungarian malecontents making a diverſion in favour of the Infidels, the emperor could ſpare no great number of troops to join the confederates in Flanders, notwithſtanding which, a peace was concluded, at Ryſwick, between the allies and France, in 1697, by which all places were reſtored that had been taken on either ſide. And now the Chriſtian powers being at peace among themſelves, the Turks thought fit to agree to a truce at Carlowitz, in 1699.

About this time, Great Britain, France and Holland, entered into a treaty for the partition of the Spaniſh dominions, between the Archduke Charles, and the Dauphin of France, in caſe of the death of Charles the Second, King of Spain; they entered into this treaty without the conſent of the Auſtrian family, who looked upon themſelves as the undoubted heirs of the whole Spaniſh monarchy; and the emperor being deſired to accede to the ſaid treaty, after it was concluded, rejected the propoſal with ſome indignation. Soon after ſigning the partition treaty, died Charles the Second, King of Spain, who, by his will, left his dominions to Philip, Duke of Anjou, grandſon of Lewis the Fourteenth of France, upon which the French King immediately ſeized upon all the Spaniſh dominions, and proclaimed the Duke of Anjou King of Spain. At the ſame time, the emperor invaded Italy, and entered into a confederacy with Great Britain, the United Provinces, and other Powers, for the recovery of the Spaniſh territories, which the emperor claimed, on account of his having married one of the Infanta's of Spain, and his being deſcended from another of them: but the principal events of this war have been related already *.

Upon the 5th of May, in the year 1705, died the Emperor Leopold, in the ſixty-fifth

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* See Vol. IV. p. 30. & *ſeq.*——Vol. V. p. 205. & *ſeq.*——and Vol. VI. p. 99. & *ſeq.*

year of his age, leaving, by his third and laſt Empreſs, Magdalena Thereſa, daughter to Prince Philip William of Newburg, two ſons, Joſeph and Charles, who both ſucceeded to the Imperial throne, and three Archducheſſes, Mary Elizabeth, Mary Anne, and Mary Magdalen. Joſeph, King of the Romans, ſucceeded his father Leopold, who laid his dying commands on him to aſſiſt his brother Charles in the recovery of the Spaniſh monarchy.

Upon the 20th of April, 1711, died the Emperor Joſeph, upon which the allies uſed their utmoſt efforts to have his only brother Charles the Third, King of Spain, elected in his room; for which purpoſe, Prince Eugene detached fifty ſquadrons of horſe, and twelve battalions of foot, from the grand army in Flanders, to reinforce the Imperialiſts on the Rhine, and fruſtrate the deſigns of the French, who were endeavouring to penetrate into Germany again, in order to influence the electors, and prevent the advancement of King Charles to the Imperial throne, notwithſtanding which, he was choſen emperor on the 12th of October, by the name of Charles the Sixth.

On the 11th of April, 1713, the treaties between the plenipotentiaries of France, Great Britain, Savoy, Portugal, and the States General, were ſigned at Utrecht, by which Philip, Duke of Anjou, was acknowledged King of Spain, but the emperor refuſed the terms of accommodation, and continued the war:

however, on the 6th of March, 1714, a treaty of peace was ſigned at Raſtadt, between the Emperor, France, and Spain, by which the Spaniſh territories in Italy and the Netherlands were confirmed to the emperor, and Spain and Spaniſh America were allotted to King Philip.

The Turks having declared war againſt the Republic of Venice, in 1714, the year following, made themſelves entire maſters of the Morea; and this rapid progreſs of the Ottoman arms obliged the emperor to enter into a confederacy with the Venetians for their mutual defence. Hoſtilities having begun between the German and Ottoman empires, in the beginning of the year 1716, Prince Eugene, on the 5th of Auguſt, attacked the Turkiſh army, conſiſting of near 200,000 men, near Carlowitz, in Hungary, and entirely routed them; the Imperialiſts made themſelves maſters of all their cannon, tents, baggage, and ammunition, the military cheſt, and the Grand Vizir's pavillion. After this victory, Prince Eugene inveſted Temeſwaer, and ſoon reduced it, after having been in poſſeſſion of the Turks 164 years.

Upon the 18th of June, 1717, the Imperialiſts inveſted the city of Belgrade; and the Turks coming to the relief of it, on the 16th of Auguſt, Prince Eugene engaged them, and obtained a complete victory, ſoon after which the place ſurrendered. About the ſame time, a war breaking out between the emperor and his allies, on the one part, and Spain on the other *, a treaty of peace was concluded between them in 1720, by which treaty, Sicily was aſſigned to the emperor, and Sardinia to the Duke of Savoy.

In the year 1722, the emperor having no iſſue male, ſettled his hereditary dominions on his eldeſt daughter, the Archducheſs Maria Thereſa, which ſettlement was confirmed by the diet of the empire, obtained the name of the Pragmatic Sanction, and was guaranteed by Great Britain, France, the States General, and moſt of the other powers in Europe. The emperor having, about this time, erected an Eaſt India company at Oſtend, a miſunderſtanding aroſe between him and the maritime powers, which was at length amicably adjuſted. In the mean time, treaties were ſet on foot at Cambray, and other places, for ſettling all differences between the emperor and Spain; but theſe negotiations coming to nothing, the emperor and the King of Spain entered into a treaty themſelves, which was concluded at Vienna, in 1725 †.

In 1733, a war breaking out between France, Spain, and Sardinia, on the one part, and the emperor on the other: the emperor was driven out of all his Italian dominions, except

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* See Vol. VI. p. 105. *& ſeq.*

† See Vol. VI. p. 108.

Mantua: but on a treaty of peace which followed two years after, the emperor's dominions in the north of Italy were reſtored to him, on his ceding Naples and Sicily to Don Carlos, who thereupon relinquiſhed his claim to Tuſcany and Parma, and was recognized King of the Two Sicilies *.

In the year 1738, the Turks invaded the emperor's dominions in Servia, and recovered the whole province: they afterwards laid ſiege to Belgrade, which important fortreſs was ceded to them by a treaty which ſoon followed, and by which the Danube and the Save were ſettled, as the boundaries of the Auſtrian and Turkiſh territories in Hungary.

Upon the 28th of October, 1740, died the Emperor Charles the Sixth, upon which his daughter, the Archducheſs Maria Thereſa, conſort to the Duke of Lorrain, was recognized Queen of Hungary and Bohemia, and heireſs of all the late emperor's hereditary dominions. And notwithſtanding her right had been acknowledged and guaranteed by moſt of the powers of Europe, and the King of Pruſſia among the reſt; this prince immediately invaded Sileſia, without ſo much as a declaration of war; having only publiſhed a manifeſto, declaring, that he had no bad deſign againſt the court of Vienna, that he only intended to vindicate the pretenſions of his fa-

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* See Vol. VI. p. 112. & *ſeq.*

mily to that duchy, founded upon antient conventions, between his anceſtors the Electors of Brandenburg, and the Princes of Sileſia: on the contrary, that he was ready with all his forces, to guarantee and defend the dominions of the houſe of Auſtria, againſt all invaders; and that he would uſe his intereſt to procure the Imperial dignity for the Duke of Lorrain. In the mean time, the Pruſſians continued advancing into Sileſia, and ſeizing one ſtrong town after another, and encountering the Auſtrians at Molwitz, upon the 10th of April, 1741, entirely defeated them.

About the ſame time, Charles, Elector of Bavaria, who had married one of the archducheſſes, a daughter of the Emperor Joſeph, ſet up a claim to the hereditary dominions of the late emperor; and, being aſſiſted by the French, invaded the Queen of Hungary's dominions, compelled the electors to promiſe their votes to ſet him on the Imperial throne, and was accordingly elected emperor at Franckfort, on the 13th of January, 1743, by the name of Charles the Seventh. On the other hand, the Auſtrians invaded Bavaria, and reduced it; and, the Queen of Hungary having ceded Sileſia to the King of Pruſſia, together with the county of Glatz, in Bohemia, on condition his Pruſſian Majeſty would ſtand neuter, drove the French, who had poſſeſſed themſelves of Bohemia, out of that kingdom.

Soon after the death of the Emperor Charles the Sixth, Philip King of Spain publiſhed a memorial alſo, claiming the ſucceſſion of the emperor's hereditary dominions, the deſign of which claim was, to ſecure Lombardy for the Infant Don Philip *. Accordingly, he formed an army in Italy, conſiſting of 60,000 men, under the command of the Duke of Montemar, but the King of Sardinia declaring for the Queen of Hungary, and joining the Auſtrian army, and the Neapolitans being forced to agree to a neutrality, the Spaniards found themſelves every year under a neceſſity of encountering new difficulties.

In the year 1742, Great Britain declared for the Queen of Hungary: the year following, the Dutch marched a body of forces to her aſſiſtance; and, on the 15th of June, was fought the battle of Dettingen, in which the French were defeated, and obliged to paſs the Maine, with great precipitation ‡; after which the Netherlands became the theatre of the war, of which all ſides being at laſt tired, a peace was concluded at Aix-la-Chapelle, in October, 1748 †. In the month of January, 1745, died the Emperor Charles the Seventh, and was ſucceeded in his electorate by his eldeſt ſon Maximilian Joſeph, the preſent elector of Bavaria, who was ſoon afterwards

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* See Vol. VI. p. 116. & *ſeq.*

‡ See Vol. IV. p. 83. & *ſeq.*

† See *Ibid.* p. 102.

obliged to abandon his capital to the Auſtrians; and, being in danger of loſing all his dominions, concluded a peace with the Queen of Hungary, at Fueſſen; and on the 15th of September, 1745, Francis Stephen, Grand Duke of Tuſcany, and conſort of the Queen of Hungary, was elected emperor.

In 1756, the King of Pruſſia, having been informed, that a plan had been concerted by Auſtria, Ruſſia, and Saxony, for diſpoſſeſſing him of great part of his dominions, particularly Sileſia, he immediately put his army in motion, took poſſeſſion of Saxony, and, on the 1ſt of October, engaged Marſhal Brown, the Auſtrian general, at Lowoſcutz, and entirely defeated him. On the 6th of May, 1757, the King defeated Prince Charles of Lorrain and Marſhal Brown, near Prague, when 20,000 Auſtrians were killed, wounded, and taken priſoners. His Majeſty afterwards attacked Marſhal Daun in his entrenchments, near Colin, but not being able to force them, he was obliged to quit Bohemia.

On the 5th of November, 1757, the King of Pruſſia attacked the combined army of France and the Empire, at Roſbach, and gained a complete victory, having killed 5000 French and Imperialiſts, and taken 12,000 priſoners, with all their baggage, and 140 pieces of cannon. On the 5th of December, the ſame year, the King came up with Prince Charles of Lorrain, and the Marſhals Daun and Nadaſty, at Liſſa, when a bloody battle enſued, in which the Auſtrians were entirely defeated. In this battle, the Auſtrians had 12,000 men killed and wounded, and 20,000 taken priſoners: they loſt beſides 168 pieces of cannon, 43 colours and ſtandards, and 3000 baggage and ammunition waggons.

About the ſame time, the campaign opened on the ſide of Hanover, though it was then the depth of winter, and the weather remarkably ſevere. The French having, the preceding ſummer, repulſed the allied army, under the command of the Duke of Cumberland, took poſſeſſion of Hanover, on the 9th of Auguſt. On the 7th of September, a neutrality was ſigned, by which the allied army was confined to the country about Stade; but in the beginning of December following, the Hanoverians, having been joined by a body of Pruſſians, marched from Stade, under the conduct of Prince Ferdinand of Brunſwick, and, in the courſe of about three months, drove the French not only out of the electorate of Hanover, but out of all Germany; the French having loſt near 60,000 men in that country, by ſickneſs, and the ſeverity of the ſeaſon.

The principal events in Germany during the remaining part of this war were thoſe following: upon the 23d of June, 1758, the allied army, under the command of Prince Ferdinand of Brunſwick, near Crevelt, attacked the

French army, under the command of the Count Clermont, and entirely defeated them. On the 25th of Auguſt following, the King of Pruſſia attacked the Ruſſian army, on the frontiers of Poland, and gained a complete victory over them, killing 15,000 Ruſſians on the field of battle, taking their military cheſt, and all their artillery. On the 14th of October, the Auſtrians, under the command of Marſhal Daun, ſurpriſed the Pruſſians in their camp, and defeated them.

On the 1ſt of Auguſt, 1759, the allied army, under Prince Ferdinand, obtained a complete victory over the French, near Minden, upon the Weſer; and the King of Pruſſia having attacked the Ruſſians in their camp, near Franckfort upon the Oder, on the 12th of Auguſt following, after a moſt obſtinate engagement, and a very great ſlaughter on both ſides, the Pruſſians were obliged to retreat.

Bohemia is ſaid to be a name derived from the *Bemi*, or *Boiemi*; the antient inhabitants of this country, who, according to Tacitus, were deſcended from the Boii, a nation of Gaul, who retired into the Hyrcanian foreſt, which runs through this country, rather than ſubmit to the Roman yoke.

Bohemia was originally divided into ſeveral principalities, each governed by its reſpective Prince or Duke, till Zechus, the brother of

Lechus, who founded the monarchy of Poland, about the ſixth century, obtained a kind of ſovereignty of the whole; but was ſtill ſtiled Duke, or Great Duke, and was acknowledged the Chief, or Captain-General, of the country, which continued under the government of a great duke, until Uladiſlaus the Second, who ſucceeded his brother Duke Spitigneus the Second, in the year 1061, was created King of Bohemia, in 1086. This kingdom appears to have been elective, though the Emperors of Germany frequently impoſed a King upon the Bohemians; and, at laſt, ſeized upon the crown themſelves.

Sigiſmund, King of Hungary, and afterwards Emperor of Germany, was upon the throne of Bohemia, when John Huſs, and Jerom of Prague, endeavoured a reformation in the church, and were burnt at the ſtake for it, in 1418, by order of the council of Conſtance, though the emperor had promiſed them his protection. This occaſioned an inſurrection in Bohemia; the inhabitants of Prague threw the emperor's officers out at the windows of the council-chamber, and broke their necks, for publiſhing a proclamation, forbidding the Huſſites to aſſemble for Divine Service; and Ziſca, a Bohemian nobleman, and the leader of the Huſſites, aſſembling an army of 40,000 Bohemians, defeated the emperor's forces in ſeveral engagements, and drove the Imperialiſts out of the kingdom, which the emperor was not able to recover from the Huſſites, till they were ruined by their own diviſions; after which they underwent a very ſevere perſecution, and the emperor re-eſtabliſhed his dominion over Bohemia.

In the year 1609, during the reign of the Emperor Rodolph, the Proteſtants of Germany formed a confederacy, called the Union, or Evangelical League, of which they choſe Frederick the Fourth, Elector Palatine, for their head: with theſe, the Proteſtants of Bohemia joined, under pretence of being oppreſſed by the emperor, and called in his brother Matthias to their aſſiſtance, obliging the Emperor Rodolph to reſign the crown of Bohemia to Matthias, who was proclaimed and crowned King of Bohemia, in 1611, and elected emperor upon the death of Rodolph the year following.

In 1616, the Emperor Matthias declared his couſin Ferdinand, King of Bohemia, and cauſed him to be crowned and recognized by the States of that kingdom, with the reſtriction, that he ſhould not execute any regal act in the emperor's life-time, without his conſent. The Emperor Matthias, at this time, kept his court at Vienna, and King Ferdinand at Gratz, in Stiria; the adminiſtration of the government of Bohemia being therefore left to the privy council of that kingdom, who were generally Roman Catholics, the Bohemian Proteſtants were much diſcountenanced and oppreſſed; upon which the nobility of that perſuaſion aſſembled at Prague, in order to procure a redreſs of their grievances; at the ſame time levying forces to ſupport their pretenſions. The government, being apprehenſive of an inſurrection, deputed ſome of the Imperial miniſters to the Proteſtant nobility, to endeavour to pacify them: but the Proteſtants being heated in the aſſembly, inſulted the emperor's miniſters, by throwing ſome of them out at the caſtle window; they proceeded afterwards to expel the Jeſuits out of the city of Prague, by their own authority; at which the emperor being further exaſperated, both ſides took the field, towns were taken, and ſeveral ſkirmiſhes happened between the Imperial and Proteſtant troops.

In the mean time, the Emperor Matthias dying, King Ferdinand ſucceeded to the imperial throne, when the barons of Bohemia, notwithſtanding they had acknowledged Ferdinand for their King, in the reign of the late emperor, ſent privately to offer the crown of that kingdom to Frederick the Fifth, Elector Palatine, who was the head of the Proteſtant league, and had married the Princeſs Elizabeth, daughter of James the Firſt, of Great-Britain. This prince being crowned King of Bohemia, in November, 1619, the Imperial generals invaded and plundered the palatinate, while the Duke of Bavaria, with another army, followed the elector into Bohemia, and in a pitched battle, near the walls of Prague, entirely defeated him. Upon which being deprived of his electorate, and expelled all his dominions, he fled to Holland, and was forced to depend upon the Court of London for his ſubſiſtence; his family not being reſtored to the electorate before the treaty of Weſtphalia, in 1648; and the Princes Rupert and Maurice, his ſons, ſerved in King Charles the Firſt's army, during the civil wars in Great Britain. The Emperors of Germany have had the dominion of Bohemia ever ſince, until the King of Pruſſia invaded and reduced the duchy of Sileſia, in 1741, which has been confirmed to him by ſeveral treaties.

Hungary, a part of the antient Panonia, was thus called from the *Huns*, a Scythian nation, who ſettled in this country in the third century. Hungary was at firſt divided into ſeveral little independent principalities, which united at length, for their mutual defence, under one head, who had the title of Duke.

The Hungarian writers relate, that their country was governed by fourteen of theſe dukes, ſucceſſively, before the nation embraced Chriſtianity: the laſt duke was Geyſa, who being converted to the Chriſtian faith, about the year 1000, was baptized by St. Adelbert, at Prague; and being old and infirm, reſigned his government, with the conſent of his people, to his ſon Stephen, who took the title of King; and the Emperor Charles the Sixth, father of the preſent Queen of Hungary, was the forty-ſeventh king of this country.

Hungary was an elective kingdom many years, but generally in one family. Charles-Robert, who aſcended the throne in 1310, ſubdued Bulgaria, Servia, Croatia, Dalmatia, Sclavonia, and ſeveral other provinces, which he annexed to his dominions, ſome of which, however, the Venetians recovered from him. In the time of Ladiſlaus, an infant King, who began his reign in 1444, the Turks invaded Hungary; but were bravely repulſed by the famous John Hunniades, who was regent of the kingdom, during the minority of Ladiſlaus, and on the death of that prince, in 1458, the Hungarians, in gratitude to the father's ſervices, elected Matthias Corvinus, the ſon of Hunniades, for their King.

Upon the death of Matthias Corvinus, Uladiſlaus, King of Bohemia, was advanced to the crown of Hungary, in 1460, after whoſe death, in 1516, Lodowick, his ſon, ſucceeded him, both in the kingdoms of Hungary and Bohemia. He was a brave warlike prince, but venturing to engage Solyman, Emperor of the Turks, with an inferior army, he was defeated and killed in the battle, in 1526, and great part of Hungary loſt. To him ſucceeded John Waywode, of Tranſylvania, who was driven from the throne by Ferdinand, brother to the Emperor Charles the Fifth, who had married Anne, the ſiſter of King Lodowick: however, Solyman, the Turkiſh emperor, reſtored him to the throne again; but his rival being ſupported by the Emperor Charles, was crowned King of Hungary in 1527, and was afterwards elected Emperor of Germany: from this time, began a war between the German and Turkiſh Emperors, for the dominion of Hungary, which laſted near two hundred years; and from the ſame time, the houſe of Auſtria have been able to influence the elections in ſuch a manner, as to keep the crown in their family ever ſince; and this kingdom is now become an abſolute hereditary monarchy; the Emperor Charles the Sixth having procured it to be ſettled on his female iſſue, in default of males; and his eldeſt daughter the Empreſs Queen enjoys the crown at this day.

Switzerland was known to the Romans by the name of *Helvetia*, and was reduced under the Roman power by Julius Cæſar, who annexed this country to that part of his government called Gallia Celtica. The Helvetians remained ſubject to the Romans, till the deſtruction of that empire, by the northern nations, when new kingdoms and ſtates being erected out of its ruins, Switzerland was comprehended in the kingdom of Burgundy, about the beginning of the fifth century *.

The kingdom of Burgundy not laſting above an hundred years; Switzerland, upon the fall of it, was annexed to the crown of France, to whoſe kings it remained ſubject to the beginning of the ninth century, when a new kingdom of Burgundy being erected, Switzerland continued a part of it, till the year 1032, when Rodolph, the Third and laſt King of Burgundy, dying without iſſue, transferred his kingdom to the Emperor Conrad the Second, called the Salick, whoſe ſucceſſors enjoyed it near two hundred years, when this kingdom being neglected by the emperors, ſeveral petty ſovereignties were formed out of it, which, upon being oppreſſed, threw off their allegiance in 1308, and declared themſelves independent ſtates; and though the houſe of Auſtria made ſeveral attempts to reduce the Cantons of Switzerland, they defended themſelves ſo well, that, at the treaty of Weſtphalia, in 1648, they were acknowledged free and independent.

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* See Vol. V. p. 54.

Since the treaty of Munſter, the Switzers have not engaged much in foreign wars, but ſeveral warm diſputes have happened among themſelves, on account of religion; and particularly in the year 1712, when a war broke out between the two Proteſtant Cantons of Zurich and Bern, and the five Catholic Cantons of Lucern, Uri, Switz, Zug, and Underwald, in which the two Proteſtant Cantons defeated the five Catholic ones, in two general engagements, and took from them the country of Baden, and ſeveral other large territories.

THE
BEAUTIES
OF
NATURE AND ART
DISPLAYED;
IN A
TOUR through the WORLD.

CHAP. VI.

OF THE
NETHERLANDS.

CHAP. VI.

Of the NETHERLANDS.

SECT. I.

A General Account of the NETHERLANDS.

THE Netherlands, anciently a part of Gallia Belgica, are ſituated between 50 and 54 degrees north latitude, and between 2 and 7 degrees eaſt longitude; their greateſt length is 300 miles, and the greateſt breadth 200 miles.

This country is bounded on the north and weſt by the German ocean, on the eaſt by Germany, and on the ſouth by France and Lorrain.

The general diviſion of this country is into, 1. The Seven United Provinces. 2. The French and Auſtrian Netherlands.

1. The Seven United Provinces are, 1. Holland. 2. Zealand. 3. Frieſland. 4. Groningen. 5. Overyſſel. 6. Gelderland and Zutphen. 7. Utrecht.

2. The French and Auſtrian Netherlands contain ten provinces. 1. Brabant. 2. Antwerp. 3. Malines. 4. Flanders. 5. Artois. 6. Cambreſis. 7. Namur. 8. Hainault. 9. Limburg. 10. Luxemburg.

The chief cities in the province of Holland are, Amſterdam, the metropolis of the United Provinces, Naerden, Haerlem, Leyden, Hague, Delft, Rotterdam, Dort, Williamſtadt, Gorcum and Heuſden in South Holland: and in North Holland, Alkimaer, Purmerent, Monkdam, Hoorn, Enchyſen. Briel and Helvoetſluys in the Iſle of Voorn, Goree in the Iſle of Goree, Somerdyke in the Iſle of Overflackee, and Burg in the Iſle of Texel.

In the province of Zealand are Zerickſee, Browerſhaven, Tolen, Middleburg, Fluſhing, with ſeveral others of leſs note.

In the province of Frieſland are Lewarden, Dockum, Franker, Harlingen, and Sloot.

In Groningen are the cities of Groningen, Dam and Winſchoten.

The chief towns in Overyſſel are Deventer, Zwoll, Coverden and Otmarſen.

Gelderland and Zutphen contain the cities of Nimeguen, Skenkenſchans, Bommel, Arnheim, Hardewick, Zutphen, Doeſburg, Groll, Gelder, ſubject to Pruſſia, Venlo and Ruremond.

In the province of Utrecht are the cities of Utrecht, Amersfort and Dueſterdwycke.

In the province of Brabant are the cities of Grave, Boiſleduc, Breda, Steenbergen, Bergen-op-zoom, Lillo, Maeſtricht, with their territories, ſubject to the Dutch; and Bruſſels the metropolis of the Auſtrian Netherlands, Louvain, Ramellies, Vilvorden, Landen, Antwerp and Mechlin, ſubject to the Houſe of Auſtria.

In the province of Flanders are the cities of Sluys, Sas van Ghent, Axel and Hulſt in Dutch Flanders; Ghent, Bruges, Oſtend, Neuport, Ypres, Dixmude, Courtray, Tournay, Oudenarde, Dendermonde and Grandmonte in Auſtrian Flanders; Liſle, Dunkirk, Douay, Mardike, St. Amand and Graveling in French Flanders.

In the province of Artois are the cities of Arras, Terouen, St. Omer, Aire, Bethune, and St. Venant, all ſubject to France.

In Cambreſis are the cities of Cambray and Crevecaur, both ſubject to France.

In the province of Namur are the cities of Namur, Charleroy, and Charlmont, ſubject to the Houſe of Auſtria.

In the province of Hainault are the cities of Mons, Aeth, Enguien, ſubject to the Houſe of Auſtria; and Valenciennes, Bouchain, Conde, and the villages of Landray and Malplaquet, ſubject to the French.

In the province of Limburg are the cities of Limburg, ſubject to the Houſe of Auſtria; and Dalem, Franquemont or Valkenburg, ſubject to the Dutch.

In the province of Luxemburg are the cities of Luxemburg, belonging to the Houſe of Auſtria; Thionville and Montmedy, ſubject to the French.

In this country are only two archbiſhoprics, Cambray and Mechlin; and the biſhoprics of Antwerp, Ghent, Bruges, Namur, Tournay, Ypres, Ruremond and St. Omers. There was formerly an archbiſhopric at Utrecht, and the biſhoprics of Haerlem, Deventer, Groningen, Lewarden and Middleburg; but theſe were ſuppreſſed when the Seven United Provinces ſhook off the Spaniſh yoke.

In the United Provinces are five univerſities: thoſe of Leyden and Utrecht are very famous; Franker, Groningen and Hardewick are leſs conſiderable.

The univerſities of Louvain in the Auſtrian Netherlands; and Douay and St. Omer, in the French Netherlands.

The chief rivers in this country are, 1. The Rhine, which enters the Netherlands in Gelderland, and divides itſelf into three branches; the 1ſt Iſſel, which runs north by Doeſburg, Zupthen and Deventer, and at laſt empties itſelf in the Zuyder ſea near Campen; 2. the Waal, and 3. the Lech, which joins the Maeſe, and runs into the German ocean near Brie. 2. The Maeſe riſes in Champagne in France, courſes northward by Namur, Liege, Hoorn, and joins the Waal at Worcum. 3. The Scheld, which riſes in Picardy, runs weſt to Catelet, north-eaſt to Cambray, Tournay, Ghent and Antwerp, where it makes a capacious harbour; it afterwards divides itſelf into two large branches, the Weſtern Scheld, which paſſes between South Beveland and Dutch Flanders, and falls into the German ocean a little below Fluſhing, and the Oſter Scheld, which runs north by Bergen-op-zoom, then eaſt between the iſlands of Beveland and Schowen, and diſcharges itſelf into the ſea with a violent current. 4. The Vecht runs from eaſt to weſt, through the province of Overyſſel, and falls into the Zuyder ſea near Haſſelt.

The air of theſe provinces is generally thick and foggy, and requires much to be purified by the eaſterly winds, which blow ſeverely for three or four months in the winter; and then they have very ſharp froſts, which ſhut up their harbours, rivers and canals, put a ſtop to

trade,

trade, but are of infinite ſervice to the health of the inhabitants.

The ſoil of this country, owing to the riches and induſtry of its inhabitants, is now become very fruitful. Though very different in different provinces, it is in general a deep rich mould; and their marſhes and bogs are drained and rendered very good paſture ground. There are fed great numbers of cattle which grow to a very large ſize: great quantities of butter and cheeſe are made in this country. Their flax is eſteemed the beſt in Europe; the country does not produce much corn, but as they are a nation of merchants, it may be reckoned the market of Europe, where commodities are bought often at a lower price than in the countries where they grow.

SECT. II.

A particular Account of the moſt curious natural Productions of the Netherlands, *in the Animal, Vegetable and Foſſil Kingdoms.*

ANIMALS, VEGETABLES, *and* FOSSILS.

THE ſtork is a native of Holland, where it builds its neſt on the tops of houſes, and feeds on frogs and ſeveral noxious reptiles, on which account great regard is paid to this bird by the inhabitants, who never deſignedly hurt or moleſt it; and it is ſaid, that to kill a ſtork is a capital offence by the laws of Holland *.

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* The ſtork is likewiſe much eſteemed and reverenced by the preſent Mahometans in Egypt, as the ibis was by the ancient Egyptians: but Dr. Shaw ſuppoſes, that the regard paid to theſe birds might originally proceed, not ſo much from the ſervice they are of to a moiſt and fenny country, in clearing it of a variety of uſeleſs reptiles and inſects, as from the ſolemn geſticulations they are obſerved to make as often as they reſt upon the ground or return to their neſts; for they firſt throw their heads backwards, then make a noiſe by ſtriking the upper and lower part of their bill together, and afterwards proſtrate their necks as it were in a ſuppliant manner, always repeating the ſame motions three or four times. See *Shaw*'s *Travels*, p. 428.

The ſtork is the white ardea, with the long wing feathers black. The generic characters of the ardea are, that the beak is very long, and ſomewhat compreſſed; the upper and under chaps of it are both of a length; and there runs a furrow from the noſtril: the legs are very long, the toes are four, and theſe are alſo long and connected. This genus comprehends the ſeveral ſorts of cranes, herons, bitterns, ſtorks, &c.

The common ſtork, when it ſtands erect, is between three and four feet high, and its body is about the ſize of that of a gooſe; the head is large, round, and ſomewhat depreſſed at the top; the neck is long and thick; the eyes are large and piercing in their aſpect; the beak is long and robuſt, very ſharp at the point, and all the way of a beautiful red; the head and neck are white, the ſhoulders, back and ſides are alſo white; and ſo are the breaſt and belly: but the rump and part of the wings are black, the legs are red, very long and naked a great way up; the feet are of a deeper red than the legs; the toes are long and robuſt, and the claws long, black, robuſt, and not ſharp, but broad like the nails of the human fingers; the barrels of the quills, from the wings, are as large as thoſe of the ſwan, and they make the moſt laſting and uſeful pens in the world.

The bird has a way of making a very odd noiſe by clapping forcibly the two ſides of the beak together. Many ſtories are related of the wonderful tenderneſs and affection the old ſtorks bear to their young, of which the following inſtance is ſufficient *. At Delft, in the year 1636, a fire broke out in a houſe that had a ſtork's neſt upon it, with young ones which could not then fly. The old ſtork, returning with ſome meat to her young, and ſeeing the danger they were in, the fire having almoſt reached the neſt, made ſeveral attempts to ſave them; but finding all in vain, ſhe at laſt ſpread her wings over them, and ſuffered herſelf to be conſumed in the flames with her offspring. The ſtork is a bird of paſſage.

Towards the mouths of the rivers Rhine and Meaſe, there is found, at a certain ſeaſon of the year, a genus of inſects, called ephemera, or ephemeron, remarkable for the ſhortneſs of its life, which is not of a day's duration, as the name imports. It is a kind of fly, having

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* The *ſtorgè*, or natural affection which all or moſt animals have for their young, is an admirable principle, as Dr. Derham obſerves, implanted in them by the wiſe Creator; whereof we have inſtances continually before our eyes. The returns of tenderneſs made by the young to the parent-animals, when grown old, are alſo very remarkable. Olaus Magnus obſerves of the crane, that when the parents through age are ſtripped of their feathers, the offspring cheriſh them under their wings, and provide them food. Pliny has a remark to the ſame purpoſe; and he likewiſe tells us, that rats nouriſh their aged parents with extraordinary affection.

four

four wings, ſix legs, and two ſtrait hairy tails. Midſummer is the uſual time of its appearance, and it lives only five or ſix hours, being hatched about ſix in the evening, and dying about eleven at night; but it muſt be obſerved, that before it aſſumes the figure of a fly, it exiſts three years under that of a worm, in a cell or caſe. It begins its change or metamorphoſis by ſhedding its coat, which being done, and the little animal thereby rendered light and nimble, it ſpends the few hours of its life in friſking over the waters; on which the female drops her eggs, and the male his ſperm on them, whereby they are impregnated. Theſe eggs deſcend to the bottom by their own gravity, and are hatched by the warmth of the ſun into little worms, which make themſelves caſes in the clay, and feed on the ſame till the time of their metamorphoſis. To dig their cells, the wiſdom of the Creator has furniſhed them with proper members, their fore legs being formed ſomewhat like thoſe of a mole, and their toothy cheeks, reſembling the claws of lobſters, ſerving them more readily to bore the clay. This worm is of different ſizes, from one inch to three, according to its age; and is compoſed of fourteen annular diviſions or rings, the firſt of which contains the head, the three following the breaſt, and the other ten the belly and tail. As to its colour, the ſmalleſt are bluiſh, ſomewhat inclining to grey; the eyes are brown, but grow black by age; and in time the whole worm becomes of a pale yellow. Having continued in this ſtate about three years, they are transformed into winged animals, leave their cells, and riſing out of the water in the ſummer evenings, they ſkim and play about its ſurface, lay their eggs, and die in a few hours. During its ſhort life, the ephemeron eats nothing, nor is it furniſhed with parts neceſſary for the reception and concoction of food; ſo that the buſineſs of generating and multiplying its kind ſeems to be the ſole end of its transformation.

There is a ſort of deſtructive reptiles called pipe-worms, which are ſometimes bred in vaſt numbers on the coaſt of Holland, and which, by gnawing their way into the pile-works of the dikes, where they take up their lodgings and feed upon the wood, have more than once alarmed the republic with terrible apprehenſions, leſt thoſe fences ſhould be deſtroyed, which defend their country from the fury of the ocean. In the year 1731, the perſons appointed to inſpect into the ſtate of the dikes, cauſed a pile that had been driven down in the ſea in 1718, to be drawn up, which appeared ſound on the outſide, but being ſplit in two, was found gnawed through and through by the worms that were lodged in it, ſome of which were above a foot long, though they ſeldom exceed ſeven or eight inches. Another pile, almoſt new, being taken up and ſplit, was found full of little holes from end to end, about the diameter of the ſhaft of a tobacco-pipe.

The head of this ſea-worm is covered with a ſort of helmet, conſiſting of two ſeparate ſhells, one on the right ſide, the other on the left, with the points of which it penetrates or bores the wood, the duſt or powder whereof is the food of the animal. The fore-part or body of the worm is of a whitiſh ſubſtance, reſembling an oyſter both in taſte and colour, but is not near ſo firm, being ſo extremely ſoft and tender, that it can hardly be touched without breaking. The hind-part is of a firmer texture, and of a greyiſh colour, terminated with a binding or annular protuberance of a ſinewy ſubſtance; from whence proceed two appendages like claws, which are as hard as the helmet, and ſmooth and white as ivory. Between theſe are two little tails, one ſtrait, the other ſomewhat curled at the extremity; both which the worm can lengthen, flatten, ſwell and contract at pleaſure.

Theſe worms are ſuppoſed to lay their eggs or ſpawn in the dog-days, which being covered with a ſlimy matter, ſtick faſt to the ſides of the piles, wherein the young ones, as ſoon as ever they are produced, begin to work themſelves a habitation. When a worm enters the pile, he bores his way ſtrait forward or horizontally, till he meets with a vein of wood to his liking. He then turns and marches up the pile perpendicularly, unleſs he come to the channel of another worm; in which caſe he alters his courſe a little, and then proceeds again in an upright direction; for it is obſerved, that in all the pieces of timber which have been ſplit for the diſcovery of theſe worms, not a ſingle cell or channel has been found interfering or entangled with another, but each runs perfectly clear and diſtinct from the reſt, though ſometimes at no greater diſtance than the thickneſs of a card. The worms uſually enter the piles about a foot from the bottom of the water, and as they advance, a white ſlimy matter iſſues from them, which hardens into a ſort of cruſt, and forms a thin and very ſmooth lining for their channels. This pipe or ſhell defends their tender bodies from the roughneſs of the wood, which might otherwiſe tear or hurt them; ſo that they ſlide up and down, or backwards and forwards, without any inconvenience or obſtruction. In theſe manſions the worms live and die, never peeping out of the timber of which they have once taken poſſeſſion.

Thoſe who have carefully examined into the ſtructure and operations of theſe inſects obſerve, that they are frequently thruſting out their little tails at the openings where they firſt entered; and it is ſuppoſed that one of the tails ſerves them to diſcharge their excrements, and the other for reſpiration, or to draw up what water they require. As for the two claws with which they are furniſhed, they are probably of uſe to them in climbing up their cells, or deſcending to the aperture at the bottom, whenever they find occaſion.

Worms of this kind are often very pernicious to ſhips, by boring and eating the planks under water in the manner juſt deſcribed: but when ſhips lie in harbours where theſe vermin abound, it is uſual to ſpread upon their ſides and bottom a compoſition of tar and beaten glaſs, whereby they are prevented from doing the miſchief which would certainly follow the neglect of ſuch a precaution.

Though the generality of natural hiſtorians regard mermen and mermaids as fabulous animals; yet, as far as the teſtimony of many writers for the reality of ſuch creatures may be depended upon, ſo much reaſon their appears for believing their exiſtence *; and ſeveral

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* Beſides the inſtance of the mermaid found in Holland, we have many others, atteſted by good authorities. Larry informs us, that ſuch a monſter was fiſhed up in the year 1187, on the coaſt of Suffolk †, which was kept ſix months, and ſeemed only to want ſpeech to render it a human creature; but one day it took an opportunity of making its eſcape, and, plunging into the ſea, was never heard of afterwards.

Another animal of the ſame ſpecies was taken in the Baltic, in 1531, and ſent as a preſent to Sigiſmund, King of Poland, with whom it lived three days, and was ſeen by all the court.

In 1560, near the iſland of Manar, which lies a little weſtward from that of Ceylon, ſome fiſhermen brought up, at one draught of a net, no leſs than

† See Vol. I. p. 34.

veral authors relate, that in the year 1430, after a violent tempeſt, which had broke down the dikes in Holland, ſome milk-maids of Edam, a town upon the Zuyder ſea, going from thence in a boat to Purmerend, found a mermaid left in the mud, with a very little water. They took her into their boat, waſhed her clean, and brought her to Edam, where they dreſſed her in women's apparel, taught her to ſpin, and fed her in the ſame manner as themſelves. Some time afterwards, ſhe was ſent to Haerlem, where ſhe lived ſeveral years; but could never be brought to ſpeak, or even to attempt it, and always ſhewed an inclination to return to the water. They taught her, however, to make the ſign of the croſs, and to pay a ſort of reverence to a crucifix; which we ſuppoſe made Parival imagine they had given her ſome notion of a deity.

than ſeven of theſe creatures; whereof ſeveral jeſuits, particularly F. Henriques, and Dimas Boſquez, phyſician to the viceroy of Goa, were witneſſes. The phyſician, who carefully examined and diſſected them, aſſerts, that all the parts, both internal and external, were perfectly conformable to thoſe of a human body.

We have alſo an account of a merman ſeen on the coaſt of Martinico, by perſons who gave an exact deſcription of it before a notary, and affirmed, they ſaw it wipe its hand over its face, and even heard it blow its noſe.

But extraordinary as the account concerning the mermaid may appear, there is a ſtory well known in Holland, which is ſtill more incredible, and is related in an inſcription in the church of Looſduynen, a village near the Hague, to the following effect: Margaret, wife of Herman, Count of Henneberg, having one day charged a poor woman with incontinency, becauſe ſhe had born twins, maliciouſly inſinuating, that no one man could get two children at once; as a judgment for her uncharitable cenſure, was, in the year 1276, delivered of three hundred and ſixty-five children at one time, who were all baptized by Guido, Suffragan of Utrecht. Here are ſhewn two braſs fonts, or baſons, in which it is ſaid thoſe children were baptized: on a ſtone which ſupports the fonts, is the following diſtich;

En tibi monſtroſum nimis et memorabile factum,
Quale nec a mundi conditione datum.

and in the Muſeum Regium, at Copenhagen, is ſhewn the ſkeleton of a fœtus, which is given out to be one of thoſe children.

Eraſmus, Lewis Vives, Camerarius, Guicciardini, Schenkius and Stowe believed this ſtory, and relate it as a fact. It is alſo mentioned by many other grave writers; and it can hardly be queſtioned, but that there was ſome very monſtrous birth, though greatly magnified through length of time, and a variety of relations *.

There are no native vegetables or foſſils in the Netherlands, which, as curioſities, deſerve any mention.

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* Inſtances might be produced, from great authorities, which, though they do not prove the certainty, will at leaſt ſupport the probability of ſome very extraordinary birth of this kind. Schenkius, already mentioned, upon the authority of John Francis, Earl of Mirandola, relates, that one Dorothy, a German lady, was delivered of twenty ſons at two births; nine at one birth, and eleven at the other. The ſame author alſo relates, that a Sicilian woman was delivered of ſeventy-three children at thirty births. Ariſtotle affirms, that there was a woman who produced twenty children at four births; and in the Memoirs of the French Royal Academy of Sciences, for the year 1709, it is affirmed, that a butcher's wife of Aix, in Provence, was delivered of nine children, each born about two days after the other, all alive, and well formed.

SECT. III.

An Hiſtorical Account of the moſt remarkable Inundations, and other public Calamities, which have, at different times, viſited the Inhabitants of the Netherlands.

THE United Provinces lie ſo low and flat, that they are in perpetual danger of being overflowed by the ocean; againſt the irruptions of which, the inhabitants have guarded by ſurpriſing banks, or dikes, the keeping of which in repair, is attended with a vaſt expence, and annually employs more men, as Sir William Temple was informed, than all the corn of the province of Holland could maintain. They have alſo made and ſupport, with wonderful care and induſtry, a great number of canals, which ſerve to drain off and receive the waters, that would otherwiſe drown their lands: Sir William Temple obſerves, that Holland appears as if, after a long contention between land and water, which it ſhould belong to, it had, at laſt, been divided between them; and from the great rivers, and ſurpriſing number of canals that are found in this province, which not only lead to every great town, but almoſt to every village and farm-houſe in the country, and the prodigious multitude of ſails that are ſeen moving upon them, one would be apt to imagine that the water had ſhared the inhabitants with the land, and that the people who live in boats hold ſome proportion with thoſe who live in houſes.

The baylwick of Dort, which is now an iſland, was part of the main land, till the year 1421, when it was ſeparated from the continent, by a tempeſt, which drove back the waters of the Meaſe and the Meruwee, with ſuch violence, that they overflowed their banks, and ſwallowed up a large tract of country between Dort and Brabant, with ſeventy villages, and an hundred thouſand inhabitants. It is ſaid, that this deſolation was occaſioned by a boor, who, being at enmity with one of his neighbours, made a hole in the bank to admit the waters, on purpoſe to drown him and his family in the night, after which the rogue deſigned to have made up the breach, but the wind being high at the ſame time, the waves broke in with ſuch force, that he was drowned in the attempt.

Near the Zuyder ſea, in the province of Frieſland, there is a tract of bituminous earth, which ſupply the neighbouring inhabitants with turf, and which, ſome centuries ago, as Guiciardini relates, took fire, the fury of which could not be ſtopped, by any art or induſtry whatever, till after it had burnt a vaſt tract of country, when it was extinguiſhed by a ſubterraneous inundation of water, which burſt out in ſuch a quantity, as formed a conſiderable lake, now called Jonkermeer. Becanus relates, that the like happened in Brabant, in 1551, and in the province of Utrecht, in 1567.

There is great reaſon to believe that the Zuyder ſea has been formed by ſucceſſive inundations; and it is ſaid, that, about the year 1250, there was a paſſage by land almoſt from the city of Straveren, in the province of Frieſland, through a great foreſt, to Enchuyſen, in North Holland, which is now a road for ſhips. In the Zuyder ſea, about a quarter of a league from Straveren, there are to be ſeen, a little under water, the ruins of an old monaſtery, which the mariners carefully avoid; and the greateſt part of the old city of Straveren has been ſwallowed up by this ſea.

SECT. IV.

An Account of the moſt celebrated Inventions, Diſcoveries, &c. of the Inhabitants of the Netherlands.

THE world is indebted to the United Provinces for ſeveral great and uſeful inventions, among which is the teleſcope, one of the nobleſt inventions the moderns can boaſt of; by means of which, the wonders of the heavens are laid open to our view, and aſtronomy is brought to a degree of perfection the antients could never arrive at, for want of ſuch an inſtrument. The teleſcope, with the concave eye-glaſs, was firſt invented by a mechanic of Middleburg, in Zealand, called Zachary Johannides, about the year 1590; though John Lipperhoy, another Dutchman, is candidate for the ſame diſcovery *, from whence this ſort of tube is called *Tubus Batavus.*

None of the teleſcopes, however, made by theſe artificers were above eighteen inches long, nor proper for aſtronomical obſervations: but the famous Galileo, aſtronomer to the Grand Duke of Tuſcany, having heard of a ſort of optic glaſs made in Holland, which brought objects nearer, ſet himſelf to conſider how it ſhould be; and having ground two pieces of glaſs into form as well as he could, he fitted them to the two ends of an organ-pipe, and by this means made great diſcoveries in the celeſtial regions, which he ſhewed to the Venetian nobility on the tower of St. Mark. From this time, Galileo applied himſelf wholly to the improving the teleſcope; and hence the honour of the invention is frequently aſcribed to him [*], and the inſtrument has been denominated Galileo's Tube.

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* Wolfius will have it, that J. Bapt. Porta, a noble Neapolitan, was the firſt who made a teleſcope, grounding his opinion on what that nobleman ſays, in a treatiſe printed in 1549, concerning

All the diſcoveries made by this ſagacious aſtronomer, tended to confirm the truth of the Copernican ſyſtem, which is now generally received as the true ſyſtem of the world. In the year 1610, he diſcovered the four Satellites, or moons of Jupiter, as Simon Marius, ma-

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ing concave and convex glaſſes, rightly joined together, with which he had aſſiſted many of his friends, who could only ſee objects in a confuſed manner. But it is certain, Porta never troubled himſelf about improving his invention, or applied it to celeſtial obſervations: and the account he gives of his glaſſes is ſo dark, that Kepler, who examined it by command of the Emperor Rodolphus, declared it was quite unintelligible.

[*] See Vol. VI. p. 207.

thematician to the Elector of Brandenburgh, did about the ſame time, but his teleſcope was not good enough to reach thoſe of Saturn, though he found that planet made an odd appearance, which very much perplexed the aſtronomers to account for, and various hypotheſes were formed for that purpoſe. Theſe all ſeemed trifling to M. Huygens, who was born at the Hague in 1629, and who applied himſelf to improve the grinding of glaſſes, and perfecting long teleſcopes, in order to obtain a more accurate knowledge of Saturn and his appendage; and accordingly in 1655, he conſtructed a teleſcope of twelve feet, with which he diſcovered a ſtupendous ring, encompaſſing the body of that planet. With a larger tube he diſcerned a ſatellite revolving round him, and four more were afterwards diſcovered by Caſſini.

It was Galileo who likewiſe firſt obſerved ſeveral dark ſpots paſſing over the ſun's diſk, from whence he appears to have a motion round his axis; and the like phænomena are obſervable on the ſurface of ſome of the planets.

Teleſcopes are of two ſorts, viz. refracting and reflecting. A refracting teleſcope conſiſts of an object-glaſs in the focus *, where-

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* By focus, opticians mean that point wherein ſeveral rays concur, and are collected, after having undergone either refraction or reflection.

of the image of a diſtant object is formed, but in an inverted poſition. This image may be viewed by a ſingle lens, or eye-glaſs, as is uſually done in viewing the heavenly bodies, becauſe it is not material whether they appear erect or inverted; but to view terreſtrial objects, whoſe image we would have erect, two other lenſes are neceſſary. If inſtead of a convex glaſs, we uſe a concave one of the ſame focal length, it will render the object erect, equally magnified, and more diſtinct and bright: but the diſadvantage of this glaſs is, that it admits of only a ſmall area, or field of view, and is therefore not fit to be uſed when we would ſee much of an object, or take in a great compaſs; it is very uſeful, however, in viewing the planets and their ſatellites, Saturn's ring, &c. and this is properly the Galilean teleſcope.

But the reflecting teleſcope is the nobleſt and moſt uſeful of all others, which conſiſts chiefly of ſpecula, or mirrors, inſtead of lenſes, and is the invention of the great Sir Iſaac Newton. What put him upon applying his thoughts this way, was the indiſtinctneſs of viſion, by refracting teleſcopes, which he found was owing to the different refrangibility of the rays of light; from whence he concluded, that refraction was too unequal a principle, and that lenſes, of whatever figures, and how truly ſoever ground, would never ſuffice for the perfection of teleſcopes. Upon this he had recourſe to a more equable principle, viz. that of reflection, and made a teleſcope conſiſting of mirrors, the firſt hint whereof he owns he took from Dr. Gregory's optics. This inſtrument has ſince received ſome farther improvements, inſomuch that a reflecting teleſcope, not more than twenty inches long, may be made to magnify an object as much as a refracting one, ſixteen feet in length.

To the invention of the teleſcope ſucceeded that of the microſcope, an inſtrument contrived to magnify the ſmalleſt objects, ſo that they may be viewed diſtinctly. By whom microſcopes were invented is not certainly known, but probably we owe the diſcovery to the Hollanders, ſince Huygens tells us, that Drebel, a Dutchman, had the firſt microſcope in 1621, and that he was reputed the inventor of it, though the honour is claimed by Fontana, a Neapolitan, who dates it from the ſame year.

They are properly diſtinguiſhed into ſingle and compound, the former conſiſting only of one glaſs, and the latter of ſeveral duly combined: and ſome of theſe are contrived to do their office by refraction, others by reflection, and others by refraction and reflection conjointly. A ſingle microſcope is either a lens or a ſpherule; but as little glaſs ſpheres may be made much ſmaller than any lens, ſo the beſt microſcopes, or thoſe which magnify moſt, are of the ſpherical kind *. Mr. Gray, and others

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* There are various methods of caſting glaſs ſpherules for microſcopes, one of which is thus given

others after him, have contrived water-microſcopes, conſiſting of ſpherules or lenſes of water inſtead of glaſs; but theſe magnify leſs, and are therefore leſs eſteemed. Hollow glaſs ſpheres, of the diameter of half a digit, filled with ſpirit of wine, are frequently uſed for microſcopes, but theſe magnify ſtill leſs than the former.

With regard to double or compound microſcopes, the beſt are thoſe which conſiſt of one object-glaſs, and two eye-glaſſes; for as objects appear dim when viewed through many glaſſes, part of the rays being reflected in paſſing through each, the multiplying of len-

given us by Dr. Adams. Take a piece of fine window-glaſs, and cut it with a diamond into as many lengths as you think needful, not exceeding an eighth part of an inch in breadth; then holding one of thoſe lengths between the fore finger and thumb of each hand, over a very fine flame, till the glaſs begins to ſoften, draw it out till it be as fine as a hair and break. Then applying each end to the pureſt part of the flame, you will preſently have two ſpheres, which you may make larger or ſmaller at pleaſure; but if they continue long in the flame, they will have ſpots, ſo that they muſt be drawn out immediately after they become round. As to the ſtem, break it off as cloſe to the ball as poſſible, and lodging the remainder of the ſtem between the plates, and drilling the hole exactly round, all this protuberance is buried between the plates, and the microſcope performs to admiration. See *Phil. Tranſ.* N°. 325.

ſes is not adviſeable. The double microſcope, contrived by our countryman Mr. Marſhal, is of a commodious and curious ſtructure; but the pocket-microſcope of Mr. Martin, furniſhed with a micrometer to meaſure the ſmalleſt parts of an object, is perhaps the plaineſt, the moſt expeditious for uſe, and the cheapeſt of any of the compound ſort hitherto invented.

Here it may be obſerved, that any teleſcope is converted into a microſcope by removing the object-glaſs, to a greater diſtance from the eye-glaſs: and ſince the diſtance of the image is various, according to the diſtance of the object from the focus, and it is magnified the more as its diſtance from the object-glaſs is greater, the ſame teleſcope may be ſucceſſively converted into microſcopes, which magnify the object in different degrees.

Many ingenious foreigners, as well as our countrymen, have applied themſelves with great diligence to improve the microſcope, and by means thereof to lay open the ſecret wonders of nature: and indeed what ſurpriſing diſcoveries may we not expect in the minute parts of the creation, from an inſtrument that makes a ſmall grain of ſand appear as big as a nut *, or a hair of the head above an inch in diame-

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* Euſtachio Divini made a microſcope, wherein, inſtead of an object-glaſs, convex on each ſide, he uſed two plano-convex glaſſes, ſo placed as to touch

diameter †? but of all thoſe who have bent their ſtudies this way, none have purſued them with more unwearied application, or made more curious and important diſcoveries, than the celebrated M. Leewenhoeck, a native of Holland; and therefore as we are treating of that country, it may not be amiſs to be a little more particular with regard to that gentleman's microſcopes, great part of which he bequeathed to the Royal Society at his deceaſe.

This legacy conſiſts of a ſmall Indian cabinet, in the drawers of which are thirteen little boxes, or caſes, each containing two microſcopes, handſomely fitted up in ſilver; all

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touch one another in the middle of their convexities. On viewing with this microſcope, ſmall grains of ſearced ſand, he perceived an animal of many feet, its back white and ſcaly, but ſo ſmall, that though the microſcope ſhewed every grain of ſand as large as an ordinary nut, the animal appeared no bigger than one of the grains ſeen without a microſcope. *Phil. Tranſ.* N°. 42.

† Mr. Wilſon's largeſt magnifiers would ſhew to any eye a hair of the head conſiderably above an inch in diameter; and to ſome eyes, it would appear two inches: but ſuppoſing it a bare inch, and that, as Dr. Hook affirms, 640 hairs-breadth make an inch, the length and breadth of an object will by ſuch a glaſs be enlarged 640 times, the ſurface 409,600 times, and the ſolidity 262,144,000 times: and yet the beſt of our glaſſes fall ſhort of M. Leewenhoeck's, in power and goodneſs. *Phil. Tranſ.* N°. 284.

which, not only the glaſſes, but the apparatus for managing them, were made by M. Leewenhoeck himſelf. Each microſcope had an object placed before it, and the whole was accompanied with a regiſter of the ſame in his own hand-writing, as being deſirous the gentlemen of the ſociety ſhould be enabled without trouble to examine ſeveral of thoſe objects on which he had made the moſt conſiderable diſcoveries, and which he thought in a particular manner deſerved their attention. Amongſt theſe objects are ſome globules of blood *; the eye of a gnat; ſmall pipes which compoſe the tooth of an elephant; part of the cryſtalline humour from the eye of a whale; the inſtruments from

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* The blood, when viewed by a microſcope, appears to conſiſt of little red globules, ſwimming in an aqueous liquor, ſuppoſed to be the Cruor and Serum, which ſeparate after emiſſion. M. Leewenhoeck computes theſe globules to be twenty-five thouſand times ſmaller than the ſmalleſt grains of ſand, and Dr. Jurin makes them ſtill leſs. Upon an accurate menſuration, he found the diameter of one of them equal to $\frac{1}{3240}$ part of an inch, or leſs than $\frac{1}{324}$ of an ordinary hair of the head.

Dr. Drake thinks the parts of the blood are not naturally globular, though its rapid motion may make it appear ſo; and Dr. Adams obſerved with his microſcope, that the blood, immediately after emiſſion, is ſo far from exhibiting any red globules, that it appears to conſiſt of infinite branches, running confuſedly together, and variouſly coloured.

whence a ſpider ſpins the threads that compoſe its web †; the *animalcula in ſemine maſculino* of a lamb, taken from the teſticle; a bunch of hair from the inſect called a hair-worm; the double ſilk ſpun by the worm; the eye of a fly; and ſeveral other ſubjects proper for microſcopical obſervations.

It would be endleſs to enter into a detail of what is to be obſerved in theſe objects, or to give a full account of M. Leewenhoeck's diſcoveries; they are ſo numerous as to make up a conſiderable part of the Philoſophical Tranſactions, and when collected together, fill four volumes in quarto, which were publiſhed by himſelf, at different times; and are of ſuch conſequence, as to have opened new ſcenes in ſome parts of natural philoſophy, particularly the late famous pretended diſcovery of animalcules in the ſeed of the male, which occaſioned a new theory of the generation of animals *.

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† M. Leewenhoeck having diſſected the body of the largeſt ſpider he could find, and nicely examined each part, at laſt diſcovered the vaſt number of inſtruments from whence the ſpider draws threads of various fineneſs, which he judged to be at leaſt four hundred, lying not cloſe together, but in ſeveral diſtinct cluſters. Another time, this gentleman took a ſpider, and laid it upon its back ſo that it could not ſtir, and then pulled out, with a very fine pair of pincers, a thread that he perceived ſticking out of one of the working inſtruments. At the ſame time he ſaw a great many very fine threads iſſuing out of its body, which, at the diſtance of a hair's-breadth or two from the body, were joined together, and made thick threads. Some of theſe threads were ſo extremely fine, as almoſt to eſcape his ſight, though he made uſe of his beſt glaſſes. Hence it appears, that the threads of a ſpider's web, which to the naked eye ſeem to be ſingle, do really conſiſt of ſeveral threads; ſome of which, even ſuppoſing the ſpider full grown, are ſo exceeding fine, that M. Leewenhoeck thought a hundred of them put together, would not make a hundredth part of the thickneſs of

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of a hair of his head. Ten thouſand, therefore, of the fine threads of a full grown ſpider, are not ſo thick as a hair; and if we add to this, what is really true, that four hundred young ſpiders, when they firſt begin to ſpin, are not, one with another, bigger than a full-grown one, and that each of thoſe ſpiders are provided with all the inſtruments of the old one, it will follow, that the ſmalleſt thread of a young ſpider is four hundred times ſmaller than that of a great one; and if ſo, then four millions of ſuch threads are not ſo thick as a hair of a man's head; which is a fineneſs quite aſtoniſhing, and beyond our conception.

* According to Ariſtotle, the males contain the principle, and the females the matter of generation; for though both were furniſhed indeed with a ſeminal liquor, yet the ſemen of the males alone was prolific. The moderns on the other hand, as well thoſe who contend for the ſyſtem of generation from eggs, as they who adopt that of the animalcules in the male-ſeed, pretend that

females

As to the ſtructure of theſe inſtruments, it is the ſame in them all, and the apparatus is

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females have no ſuch ſeminal liquor at all, and that what was commonly taken for it, was ſome other animal fluid.

There are great and many difficulties which attend the moſt plauſible account of the firſt formation of the parts of an animal, and the beginning of motion in its fluids: for though both reaſon and experience convince us, that all the parts of an animal did exiſt before generation; yet how this matter comes to aſſume ſo very different a form, as that of an embryo, is by no means agreed on.

Harvey is of opinion, that all females are furniſhed with eggs, and that the embryoes, or young animals, are formed in the ſame manner as a chick in the egg of any bird. Generation, according to this celebrated phyſician, is effected wholly by means of the uterus, or womb; which conceives the fœtus by a kind of contagion communicated to it by the male-ſeed, much in the ſame way as the load-ſtone communicates magnetiſm to iron. This contagion, he thinks, acts not only on the uterus, but is communicated to the whole body of the female, which is altogether prolific; though the uterus, he acknowledges, is the only part that is capable of conceiving the fœtus, juſt as the brain is alone capable of forming ideas and notions. Agreeably to this doctrine of Harvey, Steno and other anatomiſts have pretended to diſcover certain eggs in the ovaries, or teſticles of women; which Mr. Buffon denies to be the caſe, affirming, that there are no ſuch eggs to be found in the teſticles or ovaries of women.

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very ſimple and convenient. They are all ſingle microſcopes, conſiſting each of a very ſmall

We cannot enter into a detail of the reaſonings for and againſt the ſyſtem of generation from eggs, and ſhall therefore only obſerve, that its advocates pretend to have diſcovered eggs in all the females on which they made obſervations; that the largeſt of thoſe found in women, did not exceed the bigneſs of a pea; that they are extremely ſmall in young girls under fourteen, but that age and commerce with men makes them grow larger; that there are more than twenty ſuch eggs in each ovary, or teſticle; that they are fecundated in the ovary, by the ſpirituous and volatile part of the male-ſeed; that they afterwards are detached, and fall into the uterus through the fallopian tubes; that here the fœtus is formed of the internal ſubſtance of the egg, and the placenta of the exterior part.

Leewenhoeck is the author of another ſyſtem of generation, from animalcules in the male ſeed. He tells us, he diſcovered many thouſands of theſe in a drop leſs than a grain of ſand. They are found in the ſemen of all males whatever, but not in that of females; and are ſo ſmall, that 3,000,000,000 of them are not equal to a grain of ſand, whoſe diameter is but the hundredth part of an inch. When any of theſe animalcules gets into an egg, fit to receive it, and this falls into the womb, through the fallopian tubes, the humours which diſtil through the veſſels of the womb, penetrating the coats of the egg, ſwell and dilate it, as the ſap of the earth does ſeed thrown into it. The placenta begins to appear like a little cloud, upon one ſide of the external coat of the egg; and, at the

ſmall double-convex glaſs, let into a ſocket between two ſilver plates, rivetted together and
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the ſame time, the ſpine of the embryo-animalcule is grown ſo big, as to become viſible; and a little afterwards, the cerebrum and cerebellum appear like two bladders; and the eyes ſtand next goggling out of the head; then the beating of the heart, or punctum ſaliens, is plainly to be ſeen; and the extremities diſcover themſelves laſt of all.

Theſe animalcules are of different figures, ſome like tadpoles, and others like eels. In the ſemen of a man, and in that of a dog, there have been diſcovered two different kinds of them, the one ſuppoſed to be males, and the other females. Some even pretend to have ſeen animalcules diſengage themſelves from the membranes that ſurround them; and that they then appeared perfectly like men, with legs, arms, &c. like thoſe of the human body.

All the advocates for the ſyſtem of generation from animalcules, ſtrongly oppoſe that from eggs. They contend, that theſe animalcules cannot be looked upon as the inhabitants of the ſemen, ſince they were of greater extent than the liquor itſelf, not to mention that no ſuch animals are found in any other liquors of the body; and ſince females have nothing ſimilar to theſe animals, they think it manifeſt, that the prolific principle reſides in males. When they are aſked, to what purpoſe ſerves ſuch an immenſe profuſion of human animalcules, they anſwer, that it is agreeable to the ordinary courſe of nature, both in the animal and vegetable part of the creation. They likewiſe ſtrengthen their ſyſtem, by alledging the many examples we have of ſimilar transformations in the
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pierced with a ſmall hole. The object is placed on a ſilver point or needle, which by means

inſect-claſs of animals, which, from caterpillars and ſmall worms, become winged animals of the butterfly, or fly-kinds.

By this ſyſtem, ſays Mr. Buffon, the firſt woman cannot be ſaid to have contained the whole race of mankind, as being all, according to it, the true poſterity of the firſt man, and in their animalcule-ſtate contained only in him. On this principle, he proceeds to invalidate the ſyſtem of generation from animalcules: for ſuppoſing the ſize of a man to be 1, then will that of one of the ſpermatic animalcules be $\frac{1}{1000000000}$; and as a man is to an animalcule of the firſt generation in the ſame ratio, that this animalcule is to an animalcule of the ſecond generation, it follows that this laſt will be expreſſed by the fraction $\frac{1}{1000000000000000000}$. In this manner he computes the ſize of the animalcules of ſeveral generations, all ſuppoſed to be living animals, notwithſtanding that their minuteneſs exceeds the power of imagination to conceive; and then tells us, that the ſyſtem of generation from eggs is liable to the ſame objections, whereof the detail may be ſeen in his *Hiſt. Natur. tom.* 2. *p.* 157, *&* *ſeq.*

As to Buffon's own ſyſtem, he thinks that every part, both of animals and vegetables, contains an infinite number of organic molecules; that theſe molecules aſſume ſucceſſively different forms, and are put into different motions, according to the circumſtances they are in; but that they are much more numerous in the ſeminal liquors of both ſexes, and the ſeeds of plants, than in other parts; that means of ſcrews of the ſame metal, may be turned about, raiſed or depreſſed, and brought nearer,

that theſe organic molecules make the matter of nutrition; that this matter is always active, and tends to organization, forming itſelf into different ſhapes, according to the moulds it meets with. When the quantity of this organic matter is but ſmall, as in man, and moſt large animals, generation only takes place at the age of maturity, and even then the number of animals produced is but ſmall. The caſe is juſt the reverſe in animals, which abound with this matter, as in fiſhes, and moſt birds.

With reſpect to the generation of mankind, the ſame author thinks it a certain fact, that the male-ſeed is received into the womb of the woman; and that, for this purpoſe, it is highly probable the internal orifice opens during the act of coition. The female-ſeed alſo makes its way into the womb, where being mixed with that of the male, they both together contribute to the formation of the fœtus; which is either male or female, according as the ſeed of the man or woman abounds moſt with organic molecules; and the infant reſembles either the father or the mother, according to the different combinations of theſe molecules. Both theſe ſeminal liquors he thinks equally active in the formation of the fœtus, and that they fix and counterballance each other; the molecules of each parent being thereby determined to form ſimilar parts to thoſe of the individual that furniſhed them, as the head, trunk, arms, legs, &c. He thinks the molecules proceeding from the genital parts fix themſelves firſt; and that the other molecules arrange themſelves ſucceſſively round theſe, in nearer, or removed farther from the glaſs, as the eye of the obſerver, the nature of the object, and the convenient examination of its ſeveral parts may require. If the objects were ſolid, M. Leewenhoeck fixed them to this ſilver point with glue; but if fluid, or of ſuch a nature as not to be commodiouſly viewed unleſs ſpread upon glaſs, he firſt fitted them on a little plate of talc, or very thin blown glaſs, which he then glued to the needle. For viewing the circulation of the blood, and ſome other obſervations, he had a different apparatus.

The glaſſes of theſe microſcopes are all exceeding clear, and ſhew the object very bright and diſtinct; which is undoubtedly owing to M. Leewenhoeck's great care in the choice of his glaſs, and his exactneſs in giving it the true figure. Their powers of magnifying are dif-

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in the ſame order which they before occupied in the parent. When a great quantity of the ſeminal liquors of both ſexes is received into the womb, there are formed different ſpheres of attraction, in different parts of theſe liquors; the conſequence of which is, that ſeveral fœtuſes are formed at the ſame time.

Near a-kin to Mr. Buffon's ſyſtem, is that of Mr. Maupertuis, which he has explained in his *Venus Phyſique*. He obſerves, that all the variety, obſervable among mankind, may have been accidental at firſt; but being once eſtabliſhed in the conſtitution of the parents, they become natural to their poſterity.

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ferent, as may be requiſite for different ſorts of objects; but being all ground glaſſes, none of them are ſo ſmall, nor conſequently magnify to ſo great a degree, as ſome of thoſe little drops or ſpherules frequently uſed in other microſcopes: however, their diſtinctneſs much exceeds what is uſually met with in glaſſes of that ſort, which was the end M. Leewenhoeck principally aimed at; for though he had glaſſes by him of an extraordinary ſmallneſs for upwards of forty years, he made very little uſe of them, as having found, in a long courſe of experience, that the greateſt diſcoveries were to be made with ſuch glaſſes, as, magnifying but moderately, exhibited the object with the moſt perfect brightneſs and diſtinctneſs.

There is another inſtrument ſaid to have been firſt contrived by Drebel, the Dutchman already mentioned, viz. a Thermometer, or what is popularly called a Weather-Glaſs. As this inſtrument is deſigned to ſhew the various degrees of heat and cold, by the elaſtic or expanſive power of fluid bodies, ſo divers methods and forms of conſtructing it have been thought of at different times; firſt air, then oil, then ſpirit of wine, and laſtly, quickſilver, having been every way applied in this experiment. The moſt common thermometer is that made with ſpirit of wine, whoſe ſtructure is as follows. A glaſs ball, fixed to the bottom of a narrow tube, is filled with rectified ſpirit of wine, tinged with a little cochineal, and the top of the tube is hermetically ſealed by the flame of a lamp, which ſecures it from the preſſure of the air. Now, ſpirit of wine rarefying and condenſing very conſiderably, as the heat of the ambient air increaſes, the ſpirit is dilated, and conſequently aſcends in the tube; and as the heat decreaſes, the ſpirit is condenſed, and conſequently deſcends; ſo that the different degrees of heat and cold are known by the aſcent and deſcent of the liquor, being ſhewn by a graduated ſcale on the board to which the tube is affixed. The ball muſt be large in proportion to the bore of the tube; and that the heat or cold may ſooner penetrate the innermoſt parts of the liquor, the ball ſhould not be ſpherical, but oblong and flatted like a French flaſk.

The great defect of theſe and other thermometers is, that they are not reduced to one certain ſtandard, and therefore cannot be compared together. They mark indeed the different degrees of heat and cold; but each marks only for itſelf, and after its own manner, as not proceeding from any point of heat or cold that is common to them all. Nor can we be aſſured that when the ſpirit is riſen a degree in two different thermometers, they have both ſuffered the impreſſion of an equal additional heat; ſince the ſpirit of wine may not be the ſame in both; and this ſpirit will riſe more or leſs by the ſame heat, in proportion as it is more or leſs rectified. On theſe and ſeveral other accounts the compariſon of thermometers

mometers is very precarious; and though various methods have been propoſed by various authors, for finding a fixed point, or degree of heat and cold, from which to reckon the other degrees and adjuſt the ſcale, that ſo obſervations made at the ſame or different times, in different places, may be compared together, the matter ſeems yet undetermined.

Thermometers made with ſpirit of wine do well enough to ſhew the comparative heat of the air, but are not ſufficient for the purpoſe of the virtuoſo, who wants to explore the vaſtly different degrees of heat in other bodies, as boiling oils, melted metals, and even fire itſelf; for in ſuch degrees of heat the ſpirit will burſt the tube, and it will freeze when the cold is very intenſe, as the French philoſophers not many years ago experienced in the Swediſh Lapland. Linſeed-oil, which requires four times the heat to make it boil that water does, was uſed by Sir Iſaac Newton inſtead of ſpirit of wine; but this being inſufficient for great degrees of heat, and likewiſe ſullying the tube, it has given way to the mercurial thermometer, which will ſuſtain any degree of heat or cold, as far as an inſtrument of this kind can be expected to do. This thermometer was contrived by M. Farenheit of Amſterdam, and is now come into general uſe; though it is allowed Sir Iſaac's was as well fitted as any for a ſtandard weather-thermometer, and for any degree of heat which the various ſtates of the human body exhibit; and alſo for thoſe different

ferent degrees which vegetation requires in a green-houſe, hot-bed, &c. In all which caſes, and many others, it is neceſſary to have one common, unerring, and univerſal meaſure or ſtandard, which at all times, and in every place, will ſhew the ſame degree of heat by the ſame expanſion of the fluid.

Though the invention of paper is not aſcribed to the Dutch, yet, as that curious and uſeful manufacture has been no where carried to greater perfection than in Holland, this may be no improper place to treat of it *. The method of manufacturing paper is as follows:

The linen rags, of which our European paper is made, being carried to the mill, are firſt

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* When and by whom linen-paper was invented is not known, as Polydore Virgil confeſſes. Scaliger aſcribes the invention to the Germans, Maffei to the Italians; others to ſome refugee Greeks at Baſil, who took the hint from the manner of making cotton-paper in their own country; and Conringius thinks we received it from the Arabs. Be this at it will, linen-paper appears to have been firſt introduced amongſt us towards the beginning of the fourteenth century, which agrees with the obſervations of Count Maffei, who finds no marks of its uſe before the year 1300. Some indeed go much farther back, and take the *libri lintei*, mentioned by Livy and other Roman writers, to have been written on linen-paper; but this notion has been ſufficiently refuted. Others make the invention more modern than it really is, dating its origin

firſt ſorted, then waſhed very clean in puncheons, whoſe ſides are grated with ſtrong wires, and the bottom bored full of holes. After this they are fermented, that is, laid in ſquare heaps cloſe covered with ſacking till

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origin about 300 years ago; but Mabillon ſhews the contrary, from many manuſcripts about 400 years old written on linen-paper; and Balbinus produces divers inſtances of ſuch manuſcripts written before the year 1340. Add to this, that in the Cotton library there are writings on paper in the times of moſt of our Kings and Queens, as high as the year 1335; and Dr. Prideaux aſſures us, he has ſeen a regiſtration of ſome acts of John Cranden, Prior of Ely, made on paper, which bears date in the fourteenth year of King Edward the Second, that is, in the year 1320. The invention, according to the learned Doctor, ſeems to have been brought from the eaſt, moſt of the old manuſcripts in Arabic and other oriental languages being written on this ſort of paper, ſome of which are certainly much older than any of the dates above-mentioned. This author thinks it moſt probable, that the Saracens of Spain firſt brought it out of the eaſt into that country, from whence it was propagated through the reſt of Europe.

As to the time of its being introduced into England, we read of a paper-mill erected at Dartford as early as the year 1588, which was probably the firſt, and is celebrated by Thomas Churchyard, a noted poet of that age, in a work in verſe, intitled, ‘A Deſcription and Diſcourſe of Paper, ‘and the Benefits it brings; with the ſetting forth ‘of a Paper-mill built near Dartford, by a High ‘German, called M. Spilman, Jeweller to the ‘Queen.’ London, 1588. 4to.

they ſweat and rot, which is commonly done in four or five days. When duly fermented they are twiſted into handfuls, cut ſmall, and thrown into oval mortars made of well-ſeaſoned oak, about half a yard deep, with an iron plate at bottom an inch thick, eight inches broad, and thirty inches long. In the middle is a waſhing-block, with fine holes in it, and a piece of hair-ſieve faſtened on the inſide, ſo that nothing can paſs out except dirty water. Theſe mortars are continually ſupplied with water by little troughs from a ciſtern filled by buckets faſtened to the floats of the great wheel, which raiſes the wooden hammers for pounding the rags in the mortars. When the rags are beaten to a certain degree called the firſt ſtuff, the pulp is removed into preſſes, where it is left to mellow about a week; then it is put into clean mortars, pounded afreſh, and removed into preſſes or boxes as before, in which ſtate it is called the ſecond ſtuff. The maſs being beaten a third time, till it reſembles flour and water without any lumps, it is thereby fitted for the pit-mortar, where it is perfectly diſſolved, and is then carried to the vat to be formed into paper. The vat is rightly primed, as they call it, when the liquor has ſuch a proportion of the pulp, as that the mould dipped into it will take up juſt enough to make a ſheet of paper of the thickneſs required.

The mould is a ſquare ſieve about an inch deep, having a braſs-wire bottom, reſting on ſticks to prevent its bagging and keep it exactly horizontal. This mould the maker dips into the liquor, and gives it a ſhake as he takes it out to clear the water from the pulp. He then ſlides it along a groove to the coucher, who turns the ſheet, lays it on a felt, and returns the mould to the maker, who by this time has prepared a ſecond ſheet in another mould; and thus they proceed, laying alternately a ſheet and a felt, till they have made ſix quires of paper, which is called a poſt. This quantity is then put under a preſs, and by the ſtrength of four or five men all the water is preſſed from it; after which it is ſeparated from the felts, laid regularly one ſheet upon another, and having undergone a ſecond preſſing it is hung up to dry. When ſufficiently dried it is taken off the lines, rubbed ſmooth with the hands, and laid by till ſized, which is the next operation. For this they chuſe a fine temperate day, and having boiled a proper quantity of clean parchment or vellum ſhavings till they come to a ſize, they prepare a fine cloth, on which they ſtrew a due proportion of white vitriol and roch-alum finely powdered, and ſtrain the ſize through it into a large tub, wherein they dip as much paper at once as they can conveniently hold, and with a quick motion give every ſheet its ſhare of the ſize, which muſt be as hot as the hand can well bear it. After this it is preſſed, hung up ſheet by ſheet to dry, and then being ſorted it is told into quires, which are folded, preſſed very hard, and ſo tied up in reams or bundles for ſale.

The manner of making marbled paper is as follows. A trough is provided, either made of lead or wood well joined and pitched, of the ſhape and dimenſions of the paper to be marbled, and about four fingers deep, which is to contain the liquor uſed in the operation. This liquor is made by macerating a quantity of gum tragacanth four or five days in fair water, which is to be ſtirred from time to time, and freſh water daily added, till it be of a conſiſtence ſomewhat thinner than oil, and then it is ſtrained into the trough for uſe. The colours to be applied on the ſurface of this liquor, which are uſually blue, red, green, and yellow, being prepared of proper ingredients, there is added to them a little ox or fiſh gall; and if the colours, when ſprinkled on the liquor, do not dilate themſelves ſufficiently, more gall muſt be added; but if they ſpread too much, the fault muſt be corrected by adding more of the colour. The colours being ranged in gallipots on the table where the trough is placed, they begin by dipping a bruſh of hog's-hair into any colour, commonly the blue firſt, and ſprinkling it on the ſurface of the liquor; then the red is applied in the like manner, but with another bruſh; afterwards the yellow, and laſtly the green. When all the colours are thus floating on the liquor, they uſe a pointed ſtick, which being drawn with addreſs from one ſide of the trough to the other, ſtirs up the liquor and fluctuating colours; after which they draw a comb over the ſurface of the liquor, permitting only the teeth to enter;

and this being performed with a gentle and uniform motion, makes thoſe clouds and undulations on which the beauty of the paper very much depends. The colours lying in this poſture, the operator applies on them a ſheet of white paper previouſly moiſtened, which requires a dexterity that can only be obtained by practice, the ſurface of the liquor and paper being to meet equally in all parts; which done, before the colours have time to ſoak through, he lifts it up nimbly, and ſpreads it on a board, where having lain a while, it is hung upon a line to dry, and is then poliſhed with a marble-ſtone or knob of ivory.

It muſt be obſerved, that the ſprinkling of the colours is to be renewed, and the other operations to be performed with the ſtick and comb, at every application of a freſh ſheet of paper, becauſe each ſheet takes off all the colours from the liquor.

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SECT.

SECT. V.

Particular Deſcriptions of the moſt remarkable Public Buildings, and other ſingular Productions of Art, in the Netherlands.

THE churches of Amſterdam are in general very handſome ſtructures, adorned with fine monuments of the Dutch admirals, and other eminent men who have diſtinguiſhed themſelves in the ſervice of their country. A church, known by the name of the Old Church, is a magnificent Gothic edifice, with a beautiful and lofty ſteeple; and another church, diſtinguiſhed by the name of the New Church, which was burnt down in 1645, but is now rebuilt, is a fabric worthy the attention of every traveller of curioſity. A tower of prodigious height was intended for it, and a foundation laid accordingly, upon more than ſix thouſand piles, which, however, not proving ſtrong enough, the deſign has not been compleated. In this church are ſeveral windows finely painted, on one of which is repreſented the liberality of the citizens, in preſenting the Emperor Maximilian with a large ſum of money, and his beſtowing an imperial crown for a creſt to the city. The grate of caſt braſs before the chancel, being kept very bright, makes a pretty appearance; and the organ, which is ſupported by columns of coſtly marble, is remarkable for its number of pipes, and for its imitation of human voices: but the ſumptuous monument of the brave Admiral de Ruyter is perhaps the nobleſt ornament of this church, and deſerves the attention of thoſe who have any taſte for excellent ſculpture.

The great church at the Hague is a magnificent ſtructure. The choir is ſeparated from the body of the church by a fine braſs baluſtrade, which kind of ornament is to be ſeen in moſt of the churches in Holland. Many perſons of diſtinction are interred in this church, and amongſt the reſt the Baron of Opdam, one of the moſt famous admirals that Holland ever produced. His ſtately monument was erected at the expence of the republic, a tribute which the Dutch generally pay to the memory of their admirals and other officers who have deſerved well of their country. Upon the monument there is a long inſcription, giving an account of the Baron's great actions, and particularly of the ſea-fight with the Engliſh in 1665, wherein he was killed, his ſhip being blown up in the engagement, ſome ſay by accident, and others by his own order. In this church there is a noble organ, as there is in moſt churches in the cities and great towns throughout the United Provinces.

The new church at Delft is a very majeſtic building, its ſteeple one of the higheſt and fineſt in the Low Countries, and the chimes the moſt harmonious imaginable, conſiſting of ſeveral hundred bells of different ſizes. But this church is moſt remarkable for a magnificent mauſoleum erected over the remains of William the Firſt, Prince of Orange, the founder of the republic, who was aſſaſſinated at Delft by an emiſſary of the King of Spain. His ſtatue is of braſs, completely armed, with ſeveral emblematical figures round him, and proper inſcriptions; the whole of admirable workmanſhip, and executed in a maſterly taſte.

The great church at Gouda is one of the nobleſt ſtructures of the kind in Holland, and has a ſtately tower, which, together with the church, was burnt down by lightning in 1552, but was rebuilt with more ſplendor than before. The paintings on the windows, which repreſent in the moſt lively colours ſeveral pieces of ſacred and profane hiſtory, are ſcarce to be paralleled in Europe. They are the work of two brothers, Theodore and Walter Crabeth, who were natives of Gouda, and whoſe performances are reckoned much more beautiful than any thing done by later artiſts in that manner of painting.

Moſt of the churches at Middleburg in Zealand are ſumptuous edifices, and worthy a traveller's attention. The tower with a clock on the top of it is particularly remarkable, being very lofty; and the clock, with its dial, is ſaid to have coſt 15,000 l. ſterling.

At Utrecht the churches in general are magnificent, eſpecially that of St. Martin, formerly the cathedral, where Charles the Fifth, in 1536, held a ſolemn meeting of the Knights of the Golden Fleece. It is uſually called the Dome, and has a high tower, to which there is an aſcent by 460 ſteps, from whence there is a fine proſpect round the country, of fifteen or ſixteen cities, and a vaſt number of conſiderable villages.

The church of St. Mary in the ſame city, commonly called the Engliſh church, is much taken notice of on account of a ſtory concerning one of its pillars. When the workmen began the building, it is ſaid they met with a quagmire where the foundation of this pillar was intended to be laid, and none of them knew how to ſurmount the difficulty. At length one Fuſo, reckoned an ignorant man, undertook to do it, but aſked an exorbitant price; which the biſhop not being willing to give, privately dealt with the man's own ſon to pump out the ſecret, which was to cover the quag with bulls-hides. This being done accordingly, and Fuſo diſappointed of his expected reward, he was ſo enraged that he ſtabbed the biſhop, as the ſtory relates. There is a Latin inſcription on the pillar, aſſerting its being built on ſuch a foundation.

At Nimeguen in Guelderland there are ſeveral fine churches, the chief of which is that of St. Stephen, a noble ſtructure, whoſe roof is ſupported by thirty-five pillars of excellent workmanſhip; and its lofty tower, which was beat down in the war with Spain, has been ſince rebuilt with extraordinary magnificence. In the choir of this church is the tomb of Catharine of Bourbon, wife of Adolphus, Duke of Guelderland, with her ſtatue in braſs, and ſixteen coats of arms, denoting her deſcent.

The principal church of Zutphen, in the ſame province, is alſo a ſumptuous fabric, with a very high ſteeple built in the year 1635, after having been twice deſtroyed by lightning. It is noted for a fine monument of Otho the Third, Count of Naſſau, and his lady; and for a large braſs font of very curious workmanſhip.

In the Dutch Brabant we find ſeveral ſtately and beautiful churches, particularly the great church at Breda, which has a handſome ſpire 362 feet high, and is adorned with many noble monuments of perſons of diſtinction. That of Anglebert the Second, Count of Naſſau, who is repreſented in armour as when alive, is very much admired; the whole being ſuch an exact reſemblance of nature, that it is hardly poſſible for human art to do any thing more perfect.

To this we may add the cathedral at Bois-le-duc, which is one of the moſt ſumptuous churches in the Netherlands.

The cathedral of the city of Antwerp, in the Auſtrian Netherlands, is a moſt magnificent ſtructure, being more than 500 feet long, and 230 broad; and its ſteeple may be juſtly ranked amongſt the nobleſt in Europe. It is 466 feet high, and is ſuch an excellent piece of architecture, that the Emperor Charles the Fifth, when he made his entry into Antwerp, ſaid, ‘ It ought to be put into a caſe, and ‘ ſhewed only once a year for a rarity.’ The altars and chapels within this great church are finely adorned with paintings by Rubens and other eminent maſters. Amongſt theſe are ſome good pieces of Quintin Maſſey, a blackſmith of Antwerp, whoſe ſtory is well known*.

The Jeſuits church in this city, is a ſtructure which is equalled by few, and ſcarce excelled by any, whether we regard the materials, the workmanſhip, or the variety of fine paintings done by the celebrated Rubens. The inſide of it is lined with white marble, and the roof

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* The ſtory is, that this blackſmith falling in love with a painter's daughter, aſked her in marriage; but her father told him, he would never give her to any one except a painter. Upon this the blackſmith went to Italy, applied himſelf to painting, and in a few years returned home a greater maſter than his ſweatheart's father, and accordingly married her. He is interred at the entrance of the cathedral of Antwerp, where his effigy is put up with this inſcription:

Connubialis amor de Mulcibre fecit Apellem.

BIBLIOTHECA·BODLEIANA

ſupported by columns of the ſame materials. The great altar is alſo of marble, intermixed with gold, porphyry, and jaſper. The adjoining chapel of the Virgin is no leſs beautiful, where Rubens has painted the Aſſumption over the altar, which he uſed to call his favourite piece; and round it are ſix ſtatues of alabaſter, repreſenting the founders of the chapel.

There are few palaces in the Netherlands that merit much notice. The principal appears to be a palace belonging to the Prince of Orange, which ſtands in a pleaſant wood about a mile from the Hague, and is commonly called the Houſe in the Wood, on account of its ſituation. It is a neat and beautiful ſtructure, built by Amelia, widow of Henry-Frederic, Prince of Orange, having a large grove before it, and a ſpacious garden behind. The houſe has a moat round it, over which we paſs by a draw-bridge, and enter through a gate into a long ſhady avenue, which leads us to the front of the building. Here we aſcend a grand flight of ſteps, on each ſide whereof there is a ſtatue, one of Ceres, the other of Pomona, both ſomething bigger than the life, and of admirable workmanſhip. On the right are likewiſe placed the ſtatues of William the Firſt, and Prince Maurice, and on the left thoſe of Henry-Frederic and William the Second, all of white marble. The grand ſalon, which is of an octogonal form, takes up the body of the building, and is exceeding beautiful and magnificent, the floor being walnut-tree, and covered with rich carpets. But the principal ornament of this ſalon, and indeed of the whole palace, are the fine paintings done by the moſt eminent Flemiſh maſters, and particularly the celebrated Rubens. That of Vulcan in his ſhop, which is placed near the chimney, is the work of his pencil, and is reckoned the beſt piece in the whole collection. The military exploits of Henry-Frederic, which take up one ſide of the ſalon, and the picture of the Princeſs Amelia in mourning, are likewiſe excellent performances; and in one of the drawing-rooms there is a flower-piece valued at 1500 l. ſterling. The apartments are furniſhed in an elegant and ſumptuous manner; and there is a rail of curious Japan work, that runs along the foot of the Princeſs's bed, ſaid to have coſt near three thouſand pounds, being inlaid with mother of pearl and precious ſtones, which twinkle like the ſtars in a dark night.

On the late Prince's marriage with the Princeſs Royal of Great Britain, there were two wings added to this charming ſeat, which make it abundantly more commodious for a family than it was before. The new building is in the ſame taſte with the old, and the furniture and ornaments every way ſuitable to the beauty of the ſtructure.

At Bruſſels is an imperial palace, which ſtands on the top of a hill, with a large ſquare before

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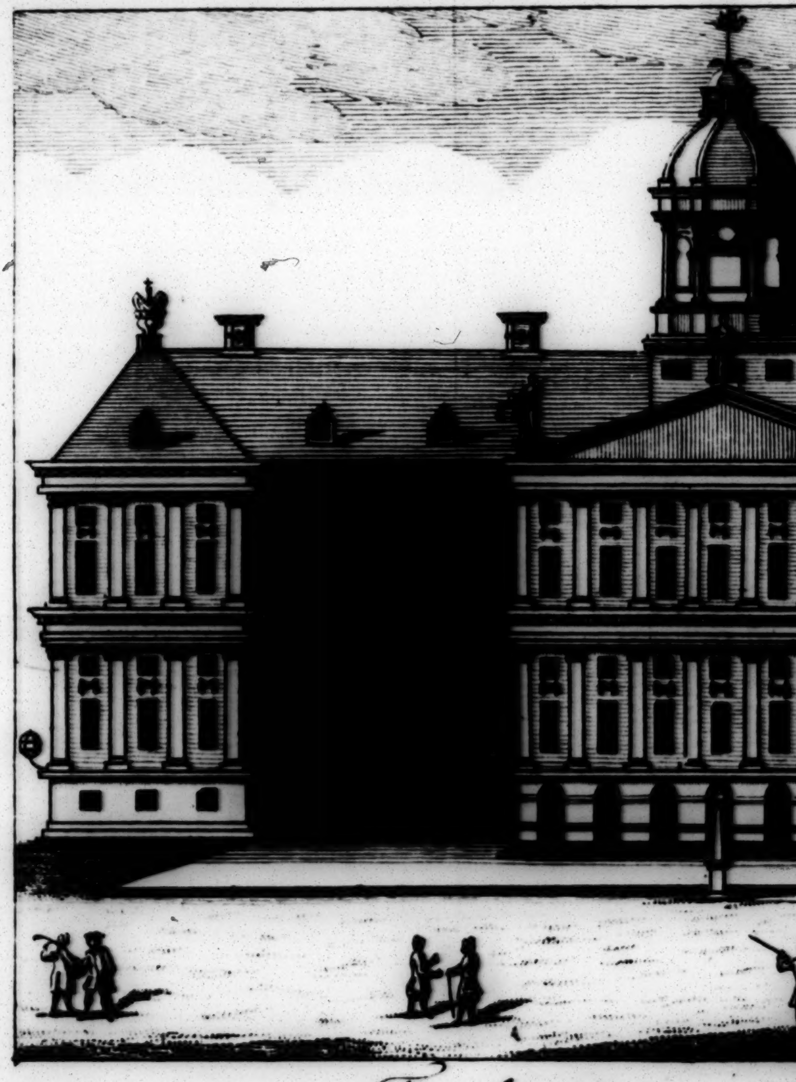
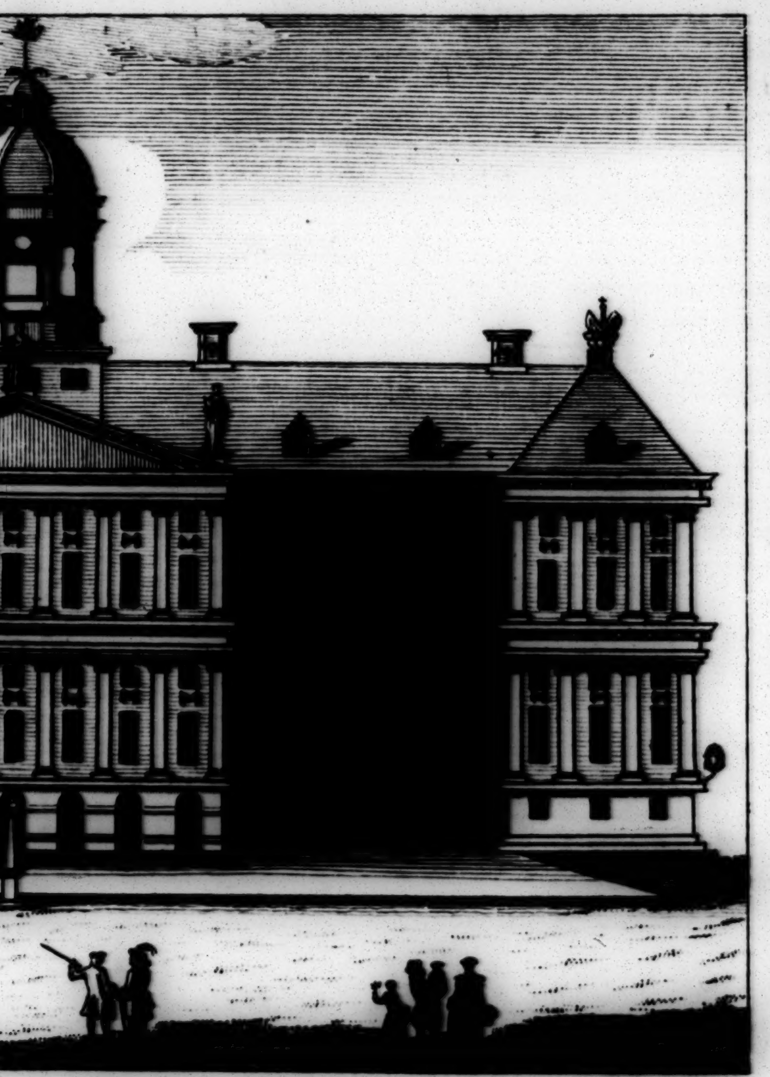


The Stadhouse at



Hulett sculp.

at Amsterdam

before it, incloſed with pillars of braſs, ſupporting ſtatues of ſeveral of the Emperors, and of the Dukes of Brabant, in braſs gilt, and as large as life. Fronting this palace are ſeveral other fine ſtatues; the royal apartments are very magnificent but irregular, having been built at different times. The garden is adorned with curious water-works, and behind the garden is a beautiful park, where company are allowed to walk. At the extremity of this park is a fine pleaſure-houſe, built by the Emperor Charles the Fifth, together with an echo, which makes twelve diſtinct replies.

The Stadthouſe of Amſterdam is generally thought to ſurpaſs any thing of the kind in Europe. This ſuperb edifice is all of free-ſtone, built upon 13659 piles *, driven into the ground cloſe to one another; and the firſt ſtone of it was laid on the 28th of October,

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* This way of building is very common in the Netherlands, where the ground is ſoft and marſhy; ſo that not only the Stadthouſe, but the whole city of Amſterdam ſtands upon ſuch foundations, viz. large piles of fir driven perpendicularly into the earth, or rather water, ſo cloſe to each other that nothing can be forced between them. Hence that facetious ſaying of Eraſmus, in a letter from Amſterdam to one of his friends, that 'he was arrived in a city where the inhabitants lived upon 'the tops of trees.' This however is a very expenſive method of building, for the foundation of the Stadthouſe is ſaid to have coſt 100,000 l. ſterling.

1648. It is a quadrangular building, 282 feet in length, 235 in depth, 90 feet high in front, and 160 to the top of the cupola. It has above four hundred windows, and is adorned with a great number of pilaſters of the Corinthian order. On the pediment in the center of the front is an admirable piece of ſculpture in relievo, repreſenting the city of Amſterdam under the figure of a woman ſitting in a chair ſupported by two lions, and holding on her knee the arms of the city. In her hand ſhe has an olive-branch, the emblem of peace; and is attended by ſea-nymphs, who preſent her with crowns of palm and laurel. Here are alſo repreſented Neptune and his tritons, with ſeveral water-animals; the whole in marble, and the workmanſhip extremely curious. At each ſide and on the top of this pediment are placed three brazen ſtatues, repreſenting Juſtice, Fortitude, and Prudence; and juſt behind it there is a handſome dome or cupola, wherein hangs a great number of bells, which compoſe very muſical chimes. In this front of the Stadthouſe there are ſeven doors, or rather open arches, alluding, as is ſuppoſed, to the Seven Provinces of the republic.

The back front of the building has alſo a pediment, with an excellent baſs-relief in marble, repreſenting the extenſive commerce of the city of Amſterdam, under the emblem of a woman with a winged cap on her head, to whom the four parts of the world, denoted by proper figures, offer preſents of their reſpective productions. On the ſides of the pediment are the ſtatues of Peace and Plenty, and on the top of it ſtands a large Atlas with a globe of copper on his ſhoulders.

When we come to view the inſide of this ſtately fabric, we are aſtoniſhed at the profuſion of fine paintings, ſculptures, and other ornaments. The courts of judicature, and indeed the greateſt part of the building, are lined with marble, and adorned with curious emblematical figures, or hiſtorical pieces, relating to the diſtribution of juſtice; particularly a repreſentation of Solomon giving judgment between the two harlots: and at the entrance of every office or chamber we find ſome ſculpture, or other decoration, adapted to the nature of the buſineſs therein tranſacted; all which are executed with ſo much art, that they are admired by the niceſt judges.

We aſcend up ſtairs to the great hall, at the entrance of which are two ſtrong folding-doors of braſs, and ſeveral fine marble columns twenty feet high, ſupporting a moſt beautiful cornice. Over this cornice ſits the figure of a woman repreſenting the city, the arms whereof ſhe wears on her breaſt, and an eagle places on her head an imperial crown. At her feet are two lions; on one ſide is a ſtatue of Fortitude, and that of Minerva on the other; and four naked children hover round her with cornucopia's, pouring out fruits and flowers. The beauty and magnificence of this hall are hardly to be deſcribed; the ſtately marble pillars, the repreſentation of the four elements at the corners, the exquiſite paintings, ſtatues, and various other ornaments, at once ſurpriſe and charm the ſpectator: but the greateſt curioſity of all is wrought on its marble floor, on which the celeſtial and terreſtrial globes are repreſented in planiſphere; the conſtellations in the one, aud the ſeveral parts of the earth in the other, with the principal circles, being all delineated in braſs very neatly laid into the marble, and the names of the countries expreſſed in the ſame manner. Each hemiſphere is about twenty-two feet in diameter, and the whole is admired by all that ſee it as a moſt ingenious performance.

In a hill near Maeſtricht there is a remarkable ſtone-quarry, which has one entrance by the ſide of the Maeſe, where carts can paſs with eaſe, and unload the ſtones on the bank of the river. The quarry runs parallel with the horizon, and by the light of torches affords one of the moſt ſurpriſing proſpects imaginable; for the walks are ſpacious and level, and the earth over-head is ſupported by ſeveral thouſands of ſquare pillars, moſt of them twenty feet high, and all wrought with ſuch neatneſs and regularity, that it looks like a ſubterraneous palace. There is very little rubbiſh in this quarry, which is owing to the goodneſs of the ſtone, and the carefulneſs of the workmen; and in ſeveral places are little pools of water, which perhaps have been made on purpoſe for beaſts to drink, and other uſes. When armies march that way, the quarry affords a ſecure retreat for the country people, who convey thither their horſes, cattle, and moveable furniture. It is capable of ſheltering an hundred thouſand men.

At Scheveling, a village on the ſea coaſt, about two miles from the Hague, is ſtill preſerved the model of a land-ſhip, or ſailing chariot, which was made for Prince Maurice of Naſſau, by Stevinus, a celebrated mathematician. In form, it reſembled a boat, was fixed upon four wheels of equal bigneſs, had two ſails, was ſteered by a rudder, placed between the two hindmoſt wheels, and was ſtopped, either by letting down the ſails, or turning it from the wind. In this machine the Prince and his companions uſed to divert themſelves, by ſailing along the ſmooth ſtrand; and it is ſaid that it was contrived to move with ſuch eaſe and ſwiftneſs, that a briſk gale would carry eight or ten perſons from Scheveling to Petten in three or four hours time, which is about fifty Engliſh miles, the perſon at the helm directing its courſe with very little labour. Biſhop Wilkins mentions ſeveral great men who have deſcribed and admired this curious invention; but all that is reported concerning the ſwiftneſs of its motion is ſcarce credible.

SECT.

SECT. VI.

Curious Remains of Antiquity in the Netherlands; *remarkable Laws and Cuſtoms of the Inhabitants; with a ſummary View of the moſt extraordinary Revolutions among them.*

REMAINS *of* ANTIQUITY, LAWS *and* CUSTOMS.

UPON theſe ſubjects, there is but little recorded in the accounts of the Netherlands. A violent ſtorm, which happened in 1646, having waſhed away the ſands from the downs of Domburg, in the iſland of Walcheren, in the province of Zealand, diſcovered ſeveral ſtones, with Roman inſcriptions, and figures of Roman deities. On one ſtone, was a figure of Jupiter, ſtanding erect, with a pike in his right hand, and an eagle at his feet. On another, was a figure of Neptune, holding a dolphin in his right hand, and a trident in his left. On a third, was a figure of the goddeſs Nehalennia, ſitting with a baſket of fruit on her left. On a fourth ſtone, was the image of the ſame goddeſs, ſtanding erect; and it would appear, that there was formerly a temple at this place, dedicated to the goddeſs Nehalennia, becauſe among the many ſtones found here engraved with antient figures and inſcriptions, ſeveral were inſcribed to this goddeſs, or had her figure engraved upon them.

Near the city of Nimeguen, is a building, which was formerly an imperial palace, and near which are ſeveral magnificent remains of ancient buildings: among theſe, is an arch of a prodigious magnitude, with ruins of other amazing arches, beſides columns and fragments of ſtones, with Roman inſcriptions.

In the year 1607, was dug up, in a garden between Dendermonde and Aloſt, in Auſtrian Flanders, an earthen veſſel, containing 1600 Roman gold medals, each about the value of a Guinea, and among them were ſeveral medals of Antoninus Pius, Marcus Aurelius, and Lucius Verus.

At Rotterdam, is ſtill ſtanding, the little obſcure houſe, in which the famous Eraſmus was born, and over the door of which is the following diſtich:

Ædibus his ortus, Mundum decoravit Eraſmus,
Artibus ingenuis, religione, ſide.

The city of Groningen is diſtinguiſhed by ſome remarkable laws, among which are thoſe following:

The names of bankrupts, if the creditors require it, are publiſhed from the upper window of the town-houſe. This now, is no more than a mark of infamy, but formerly the bankrupts were outlawed upon this publication.

Upon the death of parents in this city, the ſon poſſeſſes only a portion double to that of the daughter. No huſband or wife can ſell or mortgage one another's immoveable eſtates, without mutual conſent.

No perſon in this city can inherit, who is not baptiſed according to the form of the eſtabliſhed church.

A fourth part of the eſtates that devolve to perſons on the other ſide of the rivers Em and Lawers, not far from Groningen, comes to the public treaſury of that city.

Among the cuſtoms of the Dutch, none is more remarkable than their manner of travelling upon their canals, in Trechſchuyts, or covered boats, drawn by horſes, which is exceeding cheap, and convenient; for the fare is not above a Penny a mile, and in theſe veſſels a man may read, write, ſleep, eat, or divert himſelf without interruption, and without that fatigue and inconvenience which in a land-journey are almoſt inevitable. In the winter, when the canals are covered with ice, a farmer's wife, with a baſket of butter and eggs upon her head, and her ſkates upon her feet, will ſkim away to market ten or a dozen miles, ſell her proviſions, and in a few hours be at home again with her family. Neither does the ice prevent the carriage of more weighty burdens, for their canals are often loaded with carts and ſledges: the ſame element, thus alternately, ſerving them in the capacity of land and water.

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REVOLUTIONS *and other* MEMORABLE EVENTS.

THE ſeventeen provinces, comprehended under the name of the *Netherlands*, or *Low Countries*, were ſo denominated from their low ſituation, at the mouths of ſeveral great rivers; and the maritime provinces were almoſt one continued moraſs, till drained, not many ages ago, by the induſtry of the numerous inhabitants of the neighbouring countries, who retired hither for ſhelter, from the perſecutions and oppreſſions of their reſpective princes.

The antient name of this country was *Belgia*, a name derived from the Bellovaci, who inhabited here in the time of Julius Cæſar. Theſe provinces were antiently divided between Gaul and Germany, as they were ſituated ſouth-weſt, or north-weſt of the Rhine: thoſe ſituated ſouth-weſt of the Rhine, were, with the reſt of Gaul, reduced under the obedience of the Romans, by Julius Cæſar. Afterwards, the Batavi, the Hollanders, and Zealanders, ſubmitted alſo to the Romans: but were looked upon as allies, rather than ſubjects. When the Franks eſtabliſhed a new kingdom in Gaul, theſe provinces were at firſt united to it, but when Germany was afterwards ſeparated from France, moſt of them fell to Germany.

THE

BEAUTIES

OF

NATURE AND ART

DISPLAYED;

IN A

TOUR through the WORLD.

CHAP. VII.

OF

DENMARK, NORWAY, *and* SWEDEN.

CHAP. VII.

Of DENMARK, NORWAY, *and* SWEDEN.

SECT. I.

A general Account of Denmark, Norway, *and* Sweden.

THESE three kingdoms were, by antient geographers, comprehended under the general name of Scandinavia, and are the moſt northerly of any on the continent of Europe.

Denmark, the moſt valuable part of this country, is at preſent ſubject to its own King. It lies between 54 and 58 degrees north latitude, and between 8 and 13 degrees eaſt longitude. Its greateſt length from the Elbe in the ſouth, to Schagen in the north, is 240 miles; and its greateſt breadth, from Henegard in the weſt, to Copenhagen in the eaſt, is 180 miles. It is bounded on the north, by the Scaggerac ſea, which ſeparates it from Norway; by the Sound, which divides it from Sweden, on the eaſt; on the ſouth, by the Baltic ſea and Germany; and on the weſt, by the German ocean.

This country is naturally divided into two parts; Jutland and the iſlands formed by the Baltic ſea.

Jutland contains the provinces of Sleſwic, Rypen, Aarhuſen, Wyburg, and Alburg. The chief town in each of theſe gives name to its reſpective province.

The iſlands are Zeland, Funen, Arroe, Langland, Laland, Falſter, Mona or Moon, Femeren, Bornholm and Alſen. The moſt conſiderable towns are Copenhagen, the metropolis of the kingdom, Elſenore, Copping, Odenſee, Rutcopping, Naxhow, Nycopping, Stege, Borge, Sonderberg and Sandwick.

Norway, ſubject to the King of Denmark, is ſituated between 57 and 72 degrees north latitude, and between 4 and 30 degrees eaſt longitude. Its greateſt length from north to ſouth is 1000 miles; but its greateſt breadth is not above 180 miles. It is bounded by the Frozen ocean on the north, by the Dofrine mountains on the eaſt, which ſeparate it from Sweden; by the Scaggerac ſea on the ſouth, and by the Atlantic ocean on the weſt.

This country is divided into four provinces, 1. Aggerhuys. 2. Bergen. 3. Drontheim, and 4. Wardhuys, or Norwegian Lapland.

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of Holland conſtituted his younger ſon, Prince Maurice, their Stadtholder, who was then but ſeventeen years of age; and ſuch was the diſtreſs of the States at this time, that they offered the ſovereignty of their provinces to the King of France, who, being involved in a civil war, could not aſſiſt them; and the Duke of Parma, taking advantage of their confuſion, reduced ſeveral of their cities to the obedience of the King of Spain, which ſo terrified the confederate States, that they implored the protection of Queen Elizabeth, in the moſt abject terms.

The Queen, notwithſtanding ſhe did not think fit to accept the ſovereignty of the Netherlands, which was offered her, entered into a treaty with the confederate States, by which ſhe ſtipulated to aſſiſt them with five thouſand foot, and a thouſand horſe, which together with the forces of the States were to be commanded by an Engliſh General; that ſhips for the common defence ſhould be fitted out by both nations in equal numbers, to be commanded by the Admiral of England. Sir John Norris commanded the firſt troops which were ſent over to the Low Countries, but the Earl of Leiceſter, then the great favourite in the Engliſh court, ſoon procured that command to be conferred on himſelf. The Dutch received him with joyful acclamations, erected trophies to his honour, and pretended to eſteem him as their deliverer, conſtituting him Supreme Governor of the United Provinces, and Generaliſſimo

raliſſimo of their armies, and ſwearing obedience to him. They alſo gave him the title of *Excellency*, an honour till then never beſtowed upon a ſubject of England: but he ſoon found the great titles they had given him to be only nominal, being in all matters of moment controuled and oppoſed by a deputation of the States, which when he reſented, they applied themſelves to the Queen, inſinuating that he deſigned to render himſelf abſolute, and uſurp the dominion of their country. Complaints of this kind coming over daily from Holland, the Earl of Leiceſter was recalled in 1588. Upon Leiceſter's laying down his commiſſion, the States thought fit to create Prince Maurice, ſon to the late Prince of Orange, their Generaliſſimo, who being ſupplied from England with money and troops, and entirely confided in by the Dutch, began to act with great advantage againſt the Spaniards; and upon the death of that fortunate General the Duke of Parma, in 1592, when the Spaniſh troops grew mutinous, the Dutch advanced their conqueſts almoſt without oppoſition, ſo as to render the United Provinces intire and ſecure. The Dutch were now immoveably determined to maintain the dominion they had acquired, to which they were the more encouraged from the vaſt ſucceſſes they met with in their attacks upon the Spaniſh and Portugueſe ſettlements in the Indies, at this time, where they found ſuch immenſe treaſures, that their State grew incredibly rich, even while they were engaged in a war with the moſt potent monarch of Europe.

The loſſes the Spaniards ſuſtained at ſea, and the apprehenſion of farther miſchief to their plantations in the Eaſt and Weſt Indies, made them, at this time, very deſirous of a peace, to which the confederate provinces ſeemed no leſs averſe; nor would they enter into a treaty with Spain, till they were acknowledged free and independent ſtates; and the Spaniards condeſcended ſo far, as to ſend their plenipotentiaries to the Hague, where, in the year 1609, a truce was concluded between Spain and the United Provinces for twelve years; the Seven Provinces were to be regarded as free ſtates; and it was moreover agreed, that each party was to remain maſter of what it was then in poſſeſſion of.

The Spaniards remained poſſeſſed of almoſt eight of the other ten provinces till the Duke of Marlborough gained the memorable victory of Ramellies *, in 1706; after which, great part of theſe provinces acknowledged Charles King of Spain, afterwards Emperor, by the name of Charles the Sixth, for their ſovereign, in poſſeſſion of whoſe daughter, the Queen of Hungary, they remain to this day; and the French have been in poſſeſſion of their part of the ten provinces for near a century.

The ſtadtholderſhip of the Seven United Provinces, which was ſometimes entirely ſuppreſſed, was always elective till the year 1747,

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* See Vol. IV. p. 36.

when it was made hereditary in the iſſue male of the late Stadtholder, William Charles Henry Frizo, Prince of Orange, who died in 1751; and in default of iſſue male, in the female iſſue. William, the preſent Stadtholder, son of the late William Charles Henry Frizo, was born the 8th of March 1748.

The Franks, having made an entire conqueſt of Gaul, diſtributed moſt part of the lands amongſt their generals and officers, to one of whom great part of the Low Countries was given, under the title of Foreſter of Flanders, which officer continued for ſeveral deſcents, till Charlemagne, or Charles the Bald, of France, erected Flanders into a county, and changed the title of Foreſter to that of Count, without interrupting the ſucceſſion. The country, which was divided into ſeventeen provinces, enjoyed great privileges and immunities: and the provinces were long governed ſeparately by diſtinct princes, under various titles: but, in a ſeries of years, became united under one head, firſt in the houſe of Burgundy, and afterwards in the houſe of Auſtria *.

Charles the Fifth, Emperor of Germany, and King of Spain, in the year 1530, conſtituted the ſeventeen provinces one of the ten circles of the empire, under the title of the circle of Belgium; and he it was who made the firſt encroachment on their liberties, by introducing foreign forces, and putting foreigners into places of truſt and profit in the adminiſtration. His ſon, Philip the Second, of Spain, proceeded to deprive the States of the ſeveral provinces of their ſhare in the government, and endeavoured to render himſelf arbitrary, which occaſioned a general inſurrection of the inhabitants of the Netherlands, at

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* See Vol. V. p. 125.

the head of which appeared the Counts of Hoorn and Egmont, and the Prince of Orange; and Luther's reformation gaining ground at the ſame time in the Netherlands, his diſciples joined the malecontents: upon which, Philip introduced a kind of an inquiſition, in order to ſuppreſs them, and many thouſands were put to death by that court.

The Flemings, excited by theſe perſecutions and encroachments, broke out into a civil war, in which many battles were fought. Count Hoorn and Count Egmont were taken and beheaded; but the Prince of Orange, retiring into Holland, did, by the aſſiſtance of England and France, preſerve that, and ſix of the adjacent provinces, which entered into a treaty at Utrecht, for their mutual defence, in 1579, which treaty obtained the name of the Union at Utrecht, and was the foundation of that ſtate, which is at preſent known by the name of the United Provinces.

The principal terms of this confederacy were, that theſe ſeven provinces ſhould unite themſelves, as if they were but one province, reſerving, however, to every particular province, all their reſpective rights, liberties, and cuſtoms. They alſo mutually bound themſelves to aſſiſt each other with their lives and fortunes, againſt all attacks made upon them, under pretence of ſovereignty or religion. It was agreed, that all frontier towns belonging to the union, ſhould be fortified at the charge

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of the province, where it was ſituated: but where new fortreſſes ſhould be erected, the united provinces ſhould bear the charge. That all duties and cuſtoms ſhould be farmed out to the beſt bidder, and the royal revenues employed in their common defence. That all the inhabitants of the provinces from eighteen to ſixty, ſhould be muſtered and diſciplined, and neither peace or war ſhould be concluded, or taxes levied, without the conſent of all the provinces; and all differences that ſhould ariſe thereon, ſhould be ſubmitted to the Stadtholder. As to religion, the reſpective provinces might regulate it as they ſaw ſit, provided a free toleration was allowed; and no perſon examined, or called in queſtion for his perſuaſion in that point.

At this time, the confederate provinces were reduced to ſuch diſtreſs, that, on a medal, which was ſtruck on occaſion of their union, they repreſented their new ſtate, as a ſhip without ſails or rudder, left to the mercy of the waves, with this inſcription, *Incertum quo fata ferant*. In the mean time, a general peace was treating of at Cologne, by the mediation of the emperor, which the Prince of Orange endeavoured by all means poſſible to obſtruct; being aſſured, that if it took place, the Spaniards would ſooner or later revenge themſelves upon him and his party. As his fortune, therefore, wholly depended upon eſtabliſhing the union, his firſt endeavour was to render a reconciliation with the King of Spain impracticable; whereupon he prevailed with the provinces to renounce all allegiance to his Catholic Majeſty; and put them upon making choice of the Duke of Alençon for their Sovereign, with whom, it is ſaid, he had made a ſecret treaty to ſhare the Netherlands between them.

In the mean time, the Spaniards continued very ſucceſsful in the Netherlands, taking the cities of Bois le duc, Breda, Tournay, Valenciennes, Mechlin, &c. which induced ſeveral great men among the malecontents to go over to their party; but the Duke of Alençon, having the ſovereignty conferred on him, was ſo fortunate as to raiſe the ſiege of Cambray: his power however being limited within very narrow bounds by the States, he was adviſed by his friends to endeavour to render himſelf abſolute: upon which, he took a reſolution of ſurpriſing Antwerp, and ſome other cities of the confederates*: but his troops were repulſed by the burghers, with conſiderable loſs; the Duke having thus loſt his credit in the Netherlands, in the utmoſt confuſion at his diſappointment, returned to France, where he died not long after.

About the ſame time, in 1584, the United Provinces received a fatal blow, by the death of the Prince of Orange, who was aſſaſſinated in his palace at Delft, upon which the States

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[*] See Vol. V. p. 165.

of

The chief towns are Chriſtiana, or Anſlo, Aggerhuys, and Frederickſtadt in the province of Aggerhuys; Bergen and Stavanger in Bergen; Drontheim in Drontheim, and Wardhuys in Norwegian Lapland.

The iſlands belonging to the King of Denmark are Iceland, which is ſituated between 10 and 20 degrees weſt longitude, and between 63 and 67 degrees north latitude; Eaſt Greenland, ſituated between 10 and 30 degrees eaſt longitude, and between 76 and 80 degrees north latitude. Weſt Greenland, ſituated between the meridian of London, and 50 degrees weſt longitude, and between 60 and 75 degrees north latitude. And the Farro iſlands which lie between Iceland and Scotland, and are twenty-four in number.

Sweden lies between 56 and 69 degrees north latitude, and between 10 and 30 degrees eaſt longitude. Its greateſt length from eaſt to weſt is 900 miles, and its greateſt breadth is 500 miles. It is bounded on the north by Norwegian Lapland, by Ruſſia on the eaſt, by the Baltic, the Sound and the Scagerac ſea on the ſouth, and by the Dofrine hills, which divide it from Norway, on the weſt.

The moſt general diviſion of this kingdom is into 1. Swediſh Lapland. 2. Finland. 3. Sweden proper. 4. Gothland, and 5. the Swediſh iſlands in the Baltic.

1. Swediſh Lapland contains the provinces of Torne Lapmark, Kimi Lapmark, Lula Lapmark, Pithia Lapmark, and Uma Lapmark. The chief towns in theſe provinces are Torne, Kimi, Lula, Pithia, and Uma.

2. Finland contains the provinces of Eaſt Bothnia, Cajania, Savoloxia, Travaſtia, Finland proper, Kexholm and Carelia, the two laſt ſubject to Ruſſia. The chief towns are Nakarleby, Cajanburg, Koſkempe, Travaſtius, Abo, Raſeburg; Kedes and Wyburg.

3. Sweden proper comprehends the provinces of Angermania, Jemptia, Medelpedia, Helſingia, Geſtricia, Dalecarlia, Weſtmania, Uplandia, Nericia and Sudermania. The principal towns are Hernoſand, Reſtund, Judal, Dilſbo, Gevalia, Hedmora, Aroſia, Upſal, Stockholm, the metropolis of the kingdom, Orbro, and Tegla.

4. Gothland contains the provinces of Wermeland, Dalia, Bahus, Haland, Weſt and Eaſt Gothland, Smaland, Bleking and Schonen. The chief towns are Carolſtadt, Daleburg and Malmoe, Gottenburg, Helmſtadt and Lunden.

5. The Swediſh iſlands are Gothland, Oeland, Aland and Rugen. The chief towns in theſe iſlands are Wiſby, Bornholm, Caſtleholm and Bergen.

In Denmark are the biſhoprics of Copenhagen, Alburg, Wyburg, Arhuſen, Rypen and Sleſwic. The only univerſity is that of Copenhagen.

In Sweden is the archbiſhopric of Upſal, and the biſhoprics of Gottenburg, Lunden, Linkopping, Abo, Wexio, Scara, and Stregnis. And the Univerſities of Upſal, Lunden and Abo.

The King of Denmark has not, in all his dominions, one navigable river. The Eden and the Tron run from eaſt to weſt, for a ſhort courſe, and fall into the German ſea below Tonningen. The Trave riſes in Holſtein, runs eaſtward, and at laſt diſcharges itſelf into the Baltic below Lubec.

There are few navigable rivers in Sweden; but a number of torrents, which run from the mountains precipitately through their reſpective provinces, and diſcharge themſelves into the Gulph of Bothnia. The chief of theſe are the Torne, the Kimi, the Lula, the Pithia, the Uma, &c.

As Denmark is a flat marſhy country, ſurrounded by the ſea, the air is very ſubject to fogs. The air of Norway and Sweden is very ſharp and cold. The Dofrine mountains, which run from north to ſouth for many hundred miles, are covered with ſnow for nine months in the year. The whole country is mountainous, rocky and barren, and produces little elſe than herbage and timber. It however contains great plenty of copper and iron mines, which is the chief part of their traffic with the Engliſh, and their timber enables them to ſupply the French with materials for building their ſhips.

* * *

SECT. II.

A particular Account of the moſt curious natural Productions of Denmark, Norway, *and* Sweden, *in the Animal, Vegetable, and Foſſil Kingdoms; of remarkable Mountains and Volcanos; of medicinal and other ſingular Springs; of Lakes, Cataracts, Whirl-pools, and other natural Objects of Curioſity.*

ANIMALS.

THE rein-deer is an animal peculiar to Norway, Lapland, and other northern countries, and is a ſpecies of ſtag, with the horns ramoſe, and cylindric, and their tops palmated: the generic characters have been already exhibited *. The rein-deer is a large and very beautiful ſpecies of ſtag; it is not inferior to the elk in ſize or ſtrength, but greatly exceeds it in form, and has all the appearance of the deer kind; it is of the ſize of a ſmall horſe, but its ſhape is exactly that of the red deer; the head is oblong, large and gradually ſmaller from the region of the ears to the ſnout, where it is not ſo obtuſe as moſt of the deer kind: the horns are very large and very beautiful; and are of a middle kind between thoſe of the ſtag and of the elk; they riſe with a very large cylindric and ſtrong trunk, which is continued to a great height, as in the ſtag; and, in the ſame manner as in that ſpecies, ſends off its ramifications: but towards the top it ſpreads into breadth, and becomes palmated ſo as on the whole to exceed all the horns of the deer kind in beauty.

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* See Vol. VII. p. 102.

The rein-deer of Lapland are of wonderful ſervice to the inhabitants of that country, who bring them up to be tame and tractable, feed upon their milk and fleſh, make cloaths of their ſkins, and uſe them to draw ſledges, in which they travel over the ſnow with prodigious ſwiftneſs. This creature's colour inclines to an aſh, but his haunches and ſhoulders, and the parts under his belly are white. The feet of the rein-deer are thick, ſhort, and cloven; and when they walk their joints make a ſort of noiſe like the claſhing of ſtones one againſt another. Their ordinary food is moſs, and with this ſuſtenance only they will perform journies of eighty or a hundred miles a day. The ſledges, in which the Laplanders are drawn by the rein deer, are ſhaped like boats, only they are flatted behind, and not pointed, as they are before. The bottom of the ſledge is convex, that it may ſlide with more eaſe over the ſnow; and the traces are faſtened about the neck of the animal going down his breaſt, and between his legs. The reins are tied to his horns, whereby he is guided by the traveller, who, by the motion of his body, and the help of his hand, takes care to ballance the ſledge,

The manner of travelling in Sledges, drawn by Rein deer in Lapland

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ſledge, and prevent its overturning, which it is in danger of doing, by reaſon of the roundneſs of its bottom. They hang bells to the trappings of the rein-deer, with which the animal is ſaid to be much delighted.

The bear is a native of theſe countries, and is a genus of that claſs of quadrupeds called the *feræ*, whoſe diſtinguiſhing characteriſtic is, that the fore-teeth are ſix each way, and the canine teeth are longer than the others. The generic characters of the bear are, that the fore-teeth are of a conic figure, and are emarginated on the inner part; the inferior ones are lobated; the canine teeth are placed at a diſtance from the grinders, and are on each ſide two; the hinder tooth is very ſmall, the feet are formed for walking; and, in their uſual way of being placed down, the creature treads upon the heel. The penis is bony.

Of this genus there are two ſpecies, the *urſus* with an abrupt tail, or the common bear, and the *urſus* with an elongated tail. The common bear is a large, but an uncouth and unſightly animal, growing to different ſizes in different places, from that of a maſtiff dog to the biggneſs of a ſmall heifer; the whole creature is covered with a thick and deep fur, in ſuch manner that it appears rather a ſhapeleſs lump than an animal; the head is large and long, the neck is ſhort, but very thick; the thighs are long, but the under part of the legs ſhort, and it has a knee-pan or patella at that joint; the feet are divided each into five toes. The bear with an elongated tail grows to the ſize of a large maſtiff dog, and is bulky in proportion.

In Greenland and other parts towards the pole the bear is very large and white. The white bears of Greenland are differently ſhaped from thoſe of other countries, being leaner and ſwifter, with a longer neck, and a head more like a hound's than that of a common bear; neither can they properly be ſaid to growl, but rather bark like a dog that is hoarſe. Their ſkin is a good defence againſt the ſeverity of the cold, their hair being long and ſoft as wool, and their fleſh is indifferent food. Some of theſe creatures are ſix feet high, and fourteen in length; and they are ſaid to be ſo tender of their young, that they will rather ſuffer themſelves to be killed, then deſert them when in danger. They are often found floating on the ice at a vaſt diſtance from the ſhore, and ſwim from one mountain of ice to another, feeding on dead whales or other fiſhes they happen to meet with.

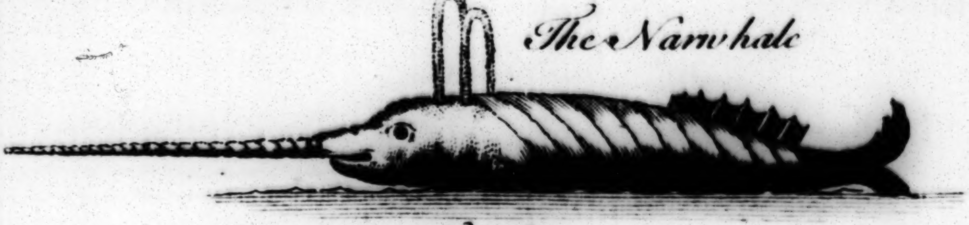
Soon after Michaelmas, Biſhop Pontoppidan obſerves, that the bear retreats to his den, which is his winter quarters, and is under ſome mountain, where the rocks hang over, or in ſome natural cavern. Here he makes himſelf a large and ſoft bed of moſs leaves, and the like materials, and hides the opening with branches and boughs of trees. Here he ſleeps all the winter, and ſometimes ſo ſound, that ſhooting at him, or otherwiſe wounding him, will not awake him; and yet when he goes out in the ſpring, he is found to be fatter than at any other time.

Bear hunting is a common exerciſe in Norway, where the natives go two or three in company with fire arms, and dogs which are trained up to that ſport; if the dogs are not able to kill him, or the huntſman is alone, and has not power to maſter him, the bear ſoon puts a period to his life, and fleas off his ſkin.

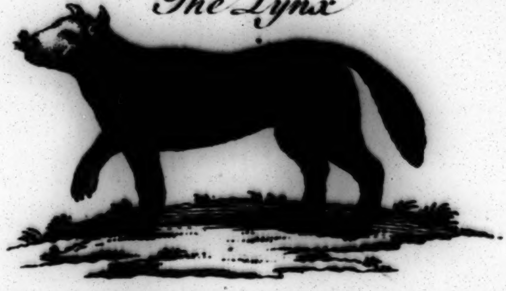
The bear goes but a month with young, and brings forth two or three cubs at a time, which are blind, naked, and as ſmall as mice, like a mere lump, without form; the mother is almoſt continually licking them, and frequently holds them up to her breaſt, to warm them, according to ſome naturaliſts, though others are of opinion it is to give them ſuck. While theſe young are bringing up, it is very dangerous to meet the old ones, becauſe they then will attack, whilſt at other times they are only upon the defenſive againſt mankind, excepting it happens to be a pregnant woman, whoſe condition they know by inſtinct, and with all their might will ſtrive to get the foetus. It has however been never known, that a bear has hurt a child, though he is fond of animal food, ſometimes killing even cows and horſes for food; but he can feed on roots, graſs and greens. There are ſeveral inſtances recorded by writers of natural hiſtory of the extraordinary ſagacity of this animal.

The lynx is alſo a native of theſe northern countries, and is the truncated tailed *felis*, or cat, with the body brown, and ſpotted with black. This is a large and robuſt animal, leſs however than the lion; the head is large, but not long, and the eyes large and fierce; the ears are very large, and are ornamented at top with a pencil of fine black hair; the mouth is furniſhed with very terrible teeth, and there are whiſkers about it, and alſo over the eyes; the breaſt is large and broad; the legs robuſt, and the claws terrible; the tail is ſhort and abrupt; but thick, and well covered with hair. The fur upon the whole animal is very long and deep, and of a ſingular colour, a kind of very pale reddiſh brown; the whole body and legs are ſpotted with black. It is a very fierce creature, and remarkable for the quickneſs of its ſight. It keeps generally in the woods, and lurks in holes in the earth, which he digs for himſelf. In the day time he will lie hid, and ſteal upon his prey, which he can ſee at a great diſtance.

The glutton, the martin, and the ermin, are alſo natives of theſe countries, and are all three ſo many ſpecies of *muſtela*, the characters of which are, that the upper fore-teeth are ſtraight, diſtinct and acute; the fore-teeth of the lower jaw are obtuſe and cluſtered, two of them



The Narwhale



The Lynx

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them ſtanding inward; the feet are made for climbing.

The glutton, or *gulo*, is the reddiſh brown muſtela, with the middle of the back black; it is about the ſize of our common cat, but the body, unleſs when diſtended with food, as is very frequently the caſe, is much ſlenderer in proportion to its length; the head is ſmall, and of an oval figure; the ears are ſhort and patulous; the noſtrils are large, and the mouth is wide, and well furniſhed with teeth; the legs are ſhort, and the claws extremely ſharp; the body is of a duſky browniſh colour, with a black ridge on the back; the belly is pale and whitiſh. It lives in woods, and takes its poſt generally on trees, from whence it precipitates itſelf down on any thing that is fit for its prey. It is the moſt ravenous of all animals, and will feed on carcaſſes, though its more uſual food is birds, and the ſmaller quadrupeds. It will eat in ſuch a manner as not to be able to ſtir for many hours, and will lie diſtended, panting, and as it were dying. Many ſtrange ſtories are related of the effects of this creature's voracious appetite.

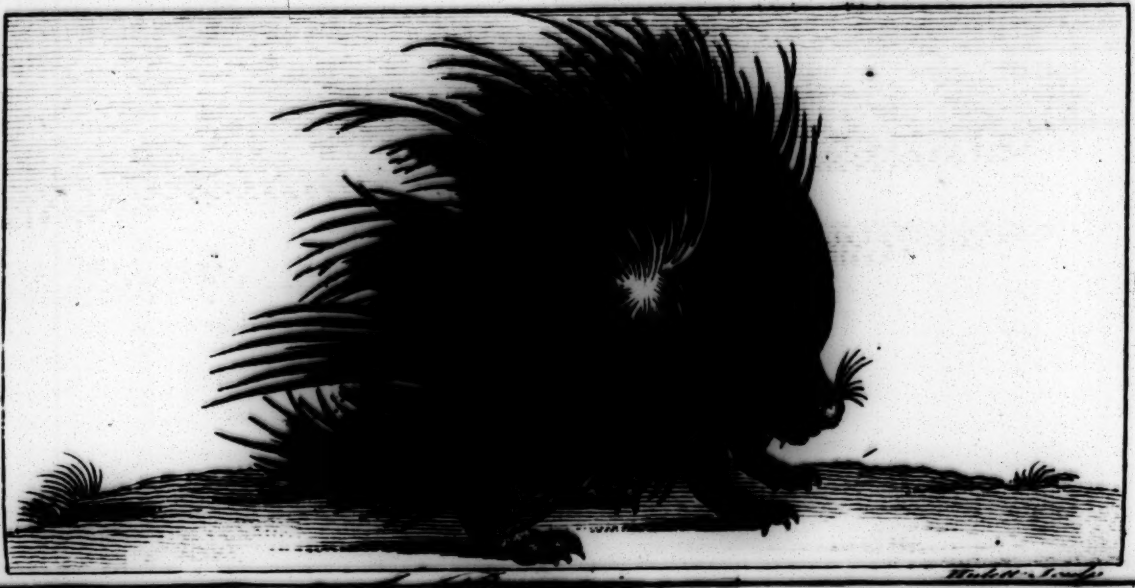
The martin is the blackiſh brown muſtela, with a pale throat, about the ſize and ſhape of the gulo; the tail is equal to the whole body in length; and is very buſhy or covered with long hair; the whole body is covered with a deep fine fur of a very dark brown. It feeds on birds, and the ſmaller quadrupeds.

The ermin, is the muſtela with narrow ears and the tip of the tail black. It is an extremely beautiful creature; the bigneſs is that of the common weaſel; the whole body of the animal is the pureſt and brighteſt white; the tip of the tail is of a deep black, and the fur is extremely valued.

The porcupine is a native of theſe northern countries, and is a genus of quadrupeds called by natural hiſtorians *hyſtrix*, the characters of which are, that the fore-teeth are obliquely truncated; there are no canine teeth; the ears are of a figure approaching to round, and the body is covered with prickles or ſpines.

The European porcupine is a conſiderably large animal, but with the ſingular covering of its ſpecies appears much more ſo than it truly is; it ſomewhat reſembles the badger in ſhape; its length from the noſe to the tail is about two feet; and the whole body is covered with a kind of briſtles; thoſe on the ſhoulders, legs, ſides and belly, are of a deep and gloſſy black; on the middle of the back, the hips and the loins, and on the tail where the ſpines have their origin, they are variegated with black and white: theſe in figure and conſiſtence perfectly reſemble the briſtles of a hog, and are quite diſtinct from the ſpines or quills.

The neck of the creature is ſhort, and the head thick and obtuſe; the noſtrils are very large; they are not however open and patulous,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as in ſome animals, but formed of a tranſverſe ſlit; the upper lip is ſplit in the middle, in the manner of that of a hare; and the front of the head is ornamented with whiſkers, like thoſe of a cat; the eyes are very ſmall, and the ears like thoſe of the human ſpecies; the top of the head is decorated with a very ſingular creſt, formed of briſtles of a great length, not leſs than eight inches, ſtanding erect; and the creſt is continued along the neck to the ſhoulders. The legs are ſhort, and the feet large; there are five toes on each of the hinder feet, and only four on each of the others; and of theſe, one, which is the exterior, and larger than the reſt, reſembles a thumb; the briſtles, which cover the whole body, are thick, and terminate in a fine point; the form of theſe are ſingular, but that of the ſpines is much more ſo. The ſpines or quills, as they are commonly called, are of two kinds, ſome are ſhorter, thicker, ſtronger, and more ſharply pointed, having a kind of double edge, like a ſhoemaker's awl; the others are longer, weaker, and more flexible, and are about a foot in length; the tail is about four inches long; it is armed with numerous ſpines, diſpoſed in ſeveral annular ſeries; and at the extremity of it, inſtead of theſe ſpines, there are ten or twelve tubular bodies of the ſame thickneſs with them, but only of about half their length; theſe ſtand on ſlender pedicles, and are open at the end, and all the way tranſparent. This creature, like the bear, ſleeps during the winter.

The leming is a quadruped peculiar to theſe countries, and is a ſpecies of mouſe [*], with a ſhort tail, and a body variegated with black and tawny; it reſembles the common rat in ſhape, but its tail is about five inches; its fur very fine, and is tinged with a variation of colours; it is alſo called the Norway rat, and ſometimes the ſable-mouſe of Lapland. It is nearly as large as a ſmall ſquirrel, and ſo fierce, that, if a ſtick be held out to it, it will bite the ſtick, and hold it ſo faſt, that one may ſwing it about as it hangs to the ſtick. It breeds in the mountainous places; and, at times, comes down into the low country, where the vaſt troops of it deſtroy all the vegetable produce; and often dying afterwards upon the place, will leave a ſtench, which occaſions peſtilential fevers. Theſe creatures in their marches keep a direct courſe, generally from north-eaſt to ſouth-weſt, and each troop conſiſts of a great many thouſands, who march in lines ſome yards long, and parallel to each other. They march by night, or in the twilight, and lie ſtill by day; and if they meet with any thing to interrupt their courſe, they do not turn out of their lines, even though it be a fire, a deep well, a river, a lake, or other obſtacle, but without heſitation venture through it, by which means vaſt numbers are ſometimes deſtroyed. If they are met ſwimming over lakes, and forced out of their courſe, they preſently return into it again; and when they are ſtopped in the fields, they raiſe themſelves upon their hinder feet like a dog, and make a kind of barking or ſqueaking noiſe, leaping up as high as a man's knee, and defending their line as long as they are able. If a houſe happens to be in their way, there they ſtop till they die; for they never come into houſes, or meddle with the food of the inhabitants. Through a ſtack of corn they will eat themſelves a paſſage, and when they march through a meadow, they damage it much by eating the roots of the graſs; but if they encamp there by day they quite ſpoil it, making it look as if it were burnt or ſtrewed with aſhes. Theſe creatures are very fruitful, but their breeding does not hinder their march; for ſome of them have been obſerved to travel with a young one in their mouths, and another upon their backs. The roots of graſs, with rotten wood, and the inſects contained in it, are their chief food; and during the winter they lie under the ſnow, having breathing holes at top.

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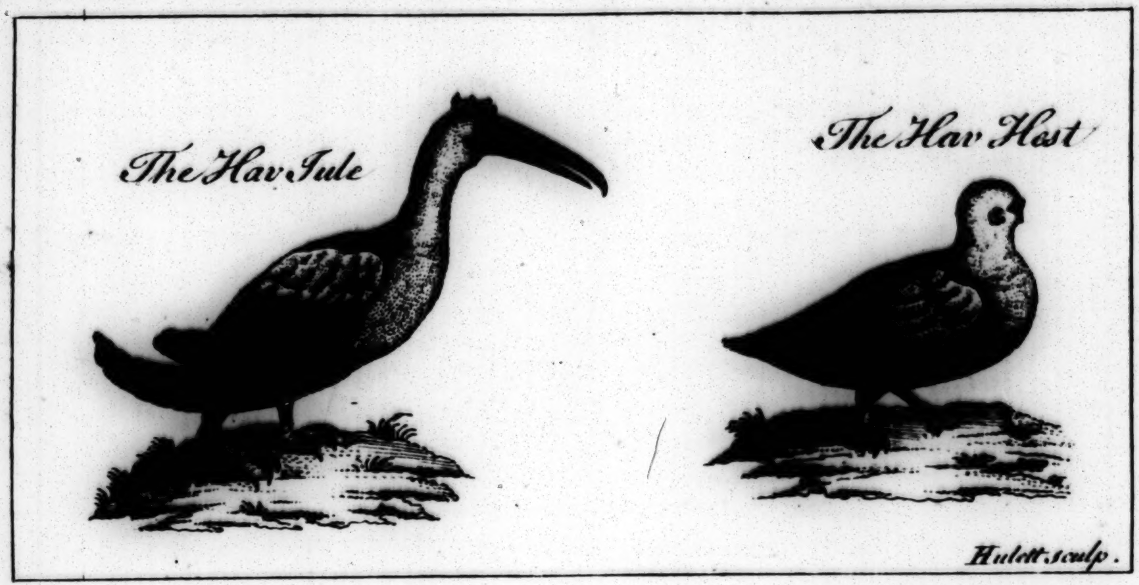
[*] See Vol. VI. p. 144.

Among the birds peculiar to theſe northern countries, one of the moſt remarkable is a bird found only in Norway, and called imber, or the great northern diver. It is a pretty large ſea bird, ſomewhat bigger than a gooſe, with a long neck; the upper part black, as well as the bill and feet; but from the breaſt downwards, it is white; the wings are ſo ſhort, that the bird can hardly raiſe itſelf with them; and the legs ſtand ſo far backwards, that they are not ſo fit to walk with, as to paddle along the water. It is ſaid, that this bird is never ſeen to come aſhore, excepting in the week before Chriſtmas; from whence inquiry has been made, how it finds place and opportunity to hatch its young; and Biſhop Pontoppidan has been informed, that theſe birds lay but two eggs; that under their wings, in their body, there are two pretty deep holes, big enough to put a man's fiſt in; in each of which they hide an egg, and hatch their young ones, as perfect, and with leſs trouble, than other birds can do on ſhore. It is alſo ſaid, that the young ones are eaſily enticed aſhore, and killed: but the old birds, which are moſt valued on account of their fine feathers and down, will elude the fowler, by diving quickly under water, and coming up again in an inſtant.

The jo-tyv is a bird of paſſage, which appears in Norway early in the ſpring, and leaves it in autumn. It is conſtantly purſuing other birds, who have any prey, to take it from them, and if it cannot come at that, it will be ſatisfied by catching up the other birds dung, as ſoon as they drop it.

The muſvit, or black cap, is one of the ſmalleſt land birds; the body is black and yellow, but white on the breaſt, with a black cap on its head. This bird is always found about houſes in Norway, and is ſuch a lover of meat, that he watches every opening, or hole, to get into the pantry, where he falls upon the meat, and will eat its way into it like a mouſe; even


The Hav Sule
The Hav Hest
Hulett sculp.

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even the meat that hangs up to be ſmoaked, can hardly be preſerved from theſe birds, which are catched like mice in a trap.

The lax-tite is a bird peculiar to Norway, and has its name from this ſingular circumſtance, that, when the ſalmon comes up the rivers, particularly in the ſpring, it follows that fiſh, and ſeems pleaſed with its company, hovering on the water where it paſſes: it is a kind of ſignal to the fiſhermen.

The hav-heſt is a ſea-bird, not larger than a moor-hen; it is ſhort and thick, with ſmall wings, and feet like a gooſe. Theſe birds ſnort like a horſe, when he fetches breath, and have a motion on the water which reſembles the trotting of a horſe, with ſuch heaving and violent puſhing, that, when they appear in large flocks, they make the ſea roar even in ſtill weather: nobody has ever ſeen this bird on land, nor does it ever approach the ſhore nearer than three or four leagues, though in ſhallow water theſe birds flock round the fiſhing boats for the entrails that are thrown over board; and ſhould any of them be ſtunned with a ſtick or ſtone, the reſt will gather round that bird, and never leave off pecking him, till he revives.

In the Norwegian and other northern ſeas there is frequently caught a large fiſh called a narval or ſea-unicorn, remarkable for its long tooth or horn, which very much reſembles ivory, but is generally more ſolid and ponderous. This fiſh is ſmooth like an eel, its colour white ſprinkled with black ſpots, and its eyes about the bigneſs of a ſix-pence. It has two fleſhy fins, and a ſemicircular hole on the top of its head, from whence it ſpouts water like a whale, and, as ſome ſay, diſcharges its excrements. The horn or tooth of this animal grows ſtrait forwards from the middle of its upper jaw, and is curiouſly wreathed, and terminates in a point. With this ſtrong weapon it dares attack the ſtrongeſt whale, and can ſtrike with ſuch violence as to pierce the ſide of a ſhip. Some imagine the chief uſe of this prominent tooth is to break the ice, but it ſeems rather deſigned for the defence of the animal, and to enable it to procure its food; for we are credibly informed of a whale caught on the coaſt of Greenland, into the belly of which a narval had ſtuck his tooth up to the root, and was ſucking the blood and humours.

What uſually paſſes amongſt us for unicorns horns, and is ſhewn for ſuch in the collections of curioſities, is probably nothing elſe but the tooth of the narval *.

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* In the year 1736, a fiſh of this kind was taken in a creek of the Elbe, in the duchy of Bremen, about four miles from the ſea, whoſe horn was ſix feet three inches long; and the fiſh itſelf, from the root of the horn to the extremity of the tail, was ſeventeen feet ſix inches.

About the iſles of Farro, there are great numbers of ſeals or ſea-calves, of different ſizes, ſome being as big as cows, and others not larger than a calf. This animal is amphibious, living either on land or in the water; and has four feet, the extremities whereof are like fins. They frequently ſleep on the rocks by the ſea-ſide, having always one upon the watch to alarm the reſt in caſe of danger. In September, when they bring forth their young, they retire into caves under the rocks, into which the natives row their boats, and kill multitudes of them with ſtaves, not without ſome danger from the old ones, as well as from the waves. The iſlanders ſometimes ſhoot them, and ſometimes take them with nets and dogs, which being trained to the ſport will ſwim to them againſt the wind, that the ſeals may not ſmell them, and catching them faſt by the throat, hold them till their maſters come to their aſſiſtance.

The fleſh of the ſeal is ſtrong and but indifferent food, though the natives ſalt up part of it with the aſhes of ſea-weed, and melt the

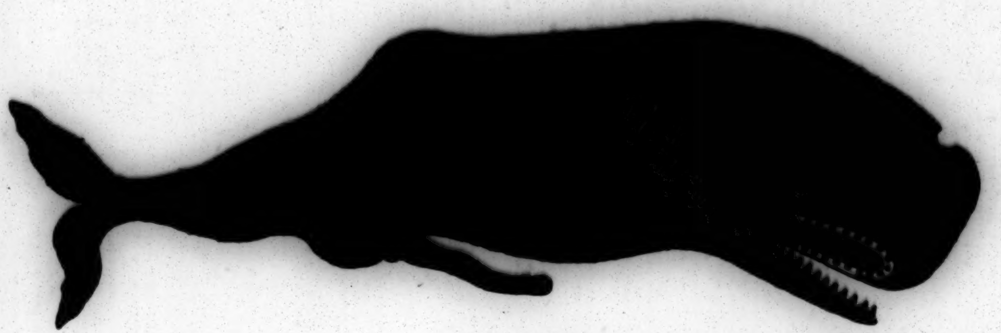
A fine horn of this ſort is preſerved in the repoſitory of St. Denis at Paris, given by And. Thevet, and pretended to have been a preſent made to him by the King of Monomotapa, who carried him to hunt the unicorn. At Straſburg there is one above ſeven feet long; and at Venice there are ſeveral, all different from each other.

reſt for oil; and of their ſkins they make ſhoes and other wearing apparel.

In the ſame ſeas there are ſeveral ſorts of whales, particularly one called the grind-whale, the largeſt whereof are about five yards long, and come in great numbers under the land when the weather is dark or foggy. When any fiſhermen ſee them, they make ſigns to all the other boats, and thus getting together, they drive the fiſh into a creek or inlet, where they kill them with ſpears made for that purpoſe. The boats divide themſelves into two ſquadrons, one of which attacks the whales, and the other draws up in the form of a half moon, to prevent their getting out of the creek; but in the ſkirmiſh the boats are ſometimes overturned, the men drowned, and the fiſh make their eſcape. Part of the fat of theſe whales they uſe inſtead of butter, ſome they melt into oil, and the reſt of the fiſh they ſalt in the ſame manner as the ſeals, which makes their fleſh pretty much reſemble bacon.

Sometimes theſe fiſh are brought in with the tide, and run upon the ſhore in a dark night, where the people find them in the morning.

There is another ſort of whales called doglins, about eight yards long, which come every year to a bay in the iſland of Suderoe, where the inhabitants drive them into an inlet, and kill them with ſpears. They are not ſo good meat as the former; for if a perſon eats their



A Whale

Hulett sculp

BIBLIOTHECA·BODLEIANA

fat, it penetrates through the pores of his ſkin, and makes him ſmell ſtrong, and look yellow.

The ſeas of Greenland are ſtored with various kinds of fiſh, which are not ſo commonly found elſewhere, eſpecially whales, and thoſe larger than in any other part of the world, ſome of them being two hundred feet in length, but the more uſual ſize is from fifty to eighty or a hundred. The true whale differs from other fiſh that bears that name in his having no teeth, inſtead of which he has a kind of whiſkers of a horny ſubſtance growing on each ſide of his upper jaw, conſiſting of a great number of different blades, ſome of them a foot broad at the bottom, and twelve or fifteen feet long, ending in a ſort of fringe, not unlike hogs briſtles. Theſe whiſkers ſplit and faſhioned are what we call whalebone, and the genital member of the animal ſerves for the ſame purpoſe, but not the fins, as is commonly imagined. The whale has a very large flattiſh head, with two ſmall eyes, not bigger than thoſe of an ox; and for his bulk he has a narrow throat, being ſeldom more than a foot wide, though he can open his jaws ſeveral fathoms. On the top of his head he has two holes, through which he draws in air, and diſcharges water taken in at his mouth, which he ſpouts up to a ſurpriſing height. His bones are hard like thoſe of quadrupeds; but, inſtead of having a cavity in the middle, they are porous and full of marrow. The belly of the whale is white, but the reſt of the body is black or reddiſh; and the fleſh is coarſe, hard, and mixed with ſinews. The outermoſt ſkin is thin, which covers another almoſt an inch thick, but ſo tender, that it is of little or no defence to the animal againſt the aſſaults of its enemies. Between this ſkin and the fleſh lies the fat or blubber, from whence train-oil is procured by boiling. The whale has very ſtrong ſinews about the tail, with which he turns and winds himſelf as he pleaſes, and ſwims with wonderful ſwiftneſs*, making a track in the ſea like a large ſhip under ſail. Theſe animals are mightily tormented with a kind of lice, which ſometimes eat large holes in their bodies; and it is ſuppoſed they feel great pain before a ſtorm, being obſerved at ſuch a time to twiſt and tumble about in a violent manner. As to the food of whales, it is probably ſmall fiſhes of ſeveral ſorts; but upon opening their bodies there is ſeldom found any thing but a few weeds, and a quantity of black inſects like ſpiders, which are very numerous in the northern ſeas.

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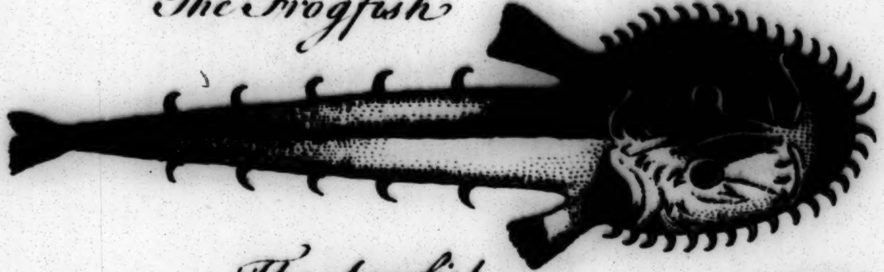
* In fiſhes the tail is the grand inſtrument of ſwimming, not the fins, as is generally imagined, theſe only ſerving to keep their bodies well poiſed and balanced, and prevent vacillation. For this reaſon fiſhes are more ſtrong and muſculous in the tail than any other part; and it is obſervable that the motive parts of all animals are the ſtrongeſt, as the thighs of men for walking, the pectoral muſcles of birds for flying, &c. The manner wherein fiſhes row themſelves forwards by the tail is well explained by Borelli in his treatiſe *de Motu Animalium*, Part I. Cap. 23.

Whales copulate like four-footed beaſts, bring forth their young alive, and ſuckle them with their milk.

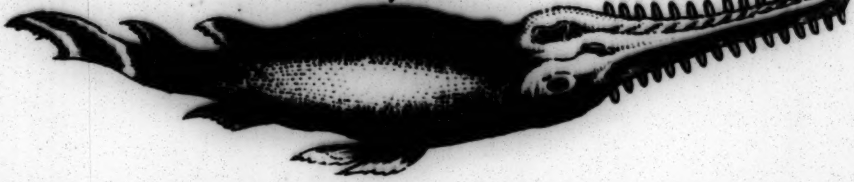
The profit ariſing from the bone and oil of theſe huge creatures induces the Dutch and ſome merchants of other nations, to ſend annually a great many ſhips to the coaſt of Greenland, where they take them in the following manner. When the ſeamen ſee or hear a whale ſpout, every one haſtens to his boat, of which there are five or ſix belonging to each ſhip, and ſix or ſeven men to each boat; and having rowed till they come pretty near the whale, the harpooner ſtrikes him with his harpoon or harping-iron, which is a kind of javelin five or ſix feet long, pointed with ſteel and bearded like an arrow, to the other end whereof a line is faſtened. This requires both ſtrength and dexterity, in order to make the wound deep enough, and in the moſt proper place. As ſoon as the whale finds himſelf wounded, he plunges ſwiftly towards the bottom of the deep, and would inevitably ſink the boat if they did not give him line enough, which they take care to do by faſtening one to another, ſometimes to the length of eight or nine hundred fathoms. The man at the helm obſerves which way the rope goes, and ſteers the boat accordingly, that it may run out directly forwards, otherwiſe the boat would ſoon be overſet; and the harpooner keeps wetting the place where the line runs, leſt the boat ſhould take fire by the quickneſs of the motion. The other boats row before, and obſerve the line, now and then drawing it in gently when they find it ſlacken, to prevent the whale's entangling it amongſt the rocks. When the fiſh is pretty far ſpent and weakened, he riſes up again for air, upon which the harpooner gives him a ſecond wound, and perhaps they dart ſeveral little ſpears into his body; till at length being quite tired, and fainting with the loſs of blood, the men have an opportunity of approaching him, and thruſting a long ſteeled lance under his fins into his inteſtines, which ſoon puts a period to his life. His vitals being touched, he ſpouts out ſtreams of blood inſtead of water, and rages moſt furiouſly, beating the ſea with his tail till it is all on a foam, and the noiſe of it may be heard at a great diſtance; till having quite loſt his ſtrength, he turns on one ſide and expires.

All the boats are now employed in towing the floating carcaſs to the ſhip, againſt the ſide of which it is faſtened by ropes, one round the neck, and another round the tail. This done, three or four men go down upon the whale with a ſort of irons on their feet to prevent their ſlipping, and with large knives cut off the fat in pieces ſeveral feet long, which are drawn up into the ſhip by lines and pullies. Then they cut off the whalebone from

The Frogfish



The Sawfish



Hulett sculp

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the upper jaw of the fiſh with a hatchet made for that purpoſe, and having thus ſtripped the carcaſe of all its fat and fins, the reſt is turned adrift, and is welcome food to the birds and bears. As the large pieces of fat are cut off, the reſt of the crew are employed in cutting them ſmaller, and picking out all the lean; after which they are put up in tubs, and ſtowed in the hold of the veſſel. When the fiſhing ſeaſon is over, nothing remains but to ſail homewards, where the blubber is boiled and melted into oil.

Beſides the whale, there are many other remarkable fiſhes and amphibious animals found near Greenland and in other parts of the Northern ocean, which require a brief deſcription. Some of theſe indeed are looked upon to be of the whale-kind, particularly the Finfiſh, which equals the Whale in length, but not in thickneſs, and has a fin on his back, which the Whale has not; from whence his name. He throws water higher than a Whale of his ſize; has brown lips, which are twiſted like a rope; and his body much reſembles a Tench in colour. He is extremely nimble, as well as ſtrong; and is killed in the ſame manner as the Whale. When theſe fiſh come upon the coaſt, the Whales diſappear.

The Horſe-Whale, called alſo the Morſe or Sea-Horſe, is an amphibious creature as large as an Ox, with four feet, a thick round head, and a ſhort neck, in which lies his greateſt ſtrength,

ſtrength. His eyes are red, his ears ſmall, and his noſtrils large, from whence he ſpouts water. His ſkin is very thick and covered with hair, and from his upper jaw proceed two long teeth, which are as white as ſnow, and more eſteemed than ivory, as they keep their colour better. This creature is very bold, making towards the boat as ſoon as he is attacked, and endeavouring to overſet it, ſometimes tearing large pieces from it with his teeth; but the ſeamen generally give him a warm reception, and diſpatch him with lances. When Whales happen to be ſcarce, the oil and teeth of theſe animals help to ſupply the deficiency[*].

The Monoceros or Sea-Unicorn is not the only enemy the Whale has to deal with. The Sword-fiſh ſo called from his ſharp-pointed upper jaw reſembling a ſword, purſues the Whale and Fin-fiſh with great eagerneſs. They are of various ſizes, from three to twenty feet in length, are ſhaped almoſt like a man's arm, and their eyes ſtand far out of their head. A few of them will diſpatch a large Whale, and when they have killed him they feed chiefly on his tongue; but ſometimes they are deprived of their prey by the fiſhermen who are ſpectators of the combat.

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[*] There is a little iſland, lying directly ſouth of Greenland, between it and the continent of Europe, remarkable for the great number of morſes that frequent the coaſt. It is called Cherry Iſland; and it appears from Harris's collection, that the Engliſh have formerly made ſeveral profitable voyages thither, where in one ſeaſon they got three hogſheads of morſes teeth, and made twenty-two tons of oil out of the fleſh of thoſe animals. In the year 1610, the Ruſſia company took poſſeſſion of the iſland, and that year they killed a thouſand morſes, and made about fifty tons of oil: But we do not find that any ſhips have been ſent thither for more than a hundred years paſt.

Another enemy of the Whale, and the moſt voracious of all, is the Hay, of which there are ſeveral ſorts, the largeſt of them about eighteen feet long, and generally of a greyiſh colour. This fiſh does not kill the Whale outright, but bites large pieces of fat from his ſides, making holes as if they had been dug with a ſhovel; inſomuch that fiſhermen have ſometimes taken Whales which have had great part of their blubber torn away in this manner. The liver of the Hay is exceeding large, and abounds in oil; and his fleſh, when dried ſome days in the air, and afterwards boiled or roaſted, is accounted tolerable food; but the leſs the fiſh, the better.

In the ſeas of Norway is to be ſeen the Flying fiſh, ſo called from its power of flying to ſome conſiderable diſtance; it is much about the ſize and form of a large herring; and beſides the uſual fins of other fiſh, it has under its neck three broad and pretty large fins of a different and finer ſtructure; being nearly as thin as the wings of a fly; but they are ſtrengthened with ten rows of bone, running between the two membranes, on the back part of the neck: this fiſh has alſo a wing, or flying fin about ſix inches long, quite erect; and lower down the back, another ſhorter, but broader fin. This fiſh is frequently ſeen, when purſued by another more powerful fiſh, to raiſe itſelf ſeveral feet above the water, and continue its flight the length of two or three gun ſhots, when it muſt drop into the water, becauſe the wings, which are grown dry, are of no ſervice to it longer than they hold moiſt.

Here alſo are found ſeveral kinds of Shark, ſome ſeveral fathoms long, and others no more than two feet in length, at full growth: theſe are fierce and voracious animals, deſtroying every other fiſh they can maſter; they have no bones, properly ſpeaking, except the Spine; the reſt being only cartilages; they are viviparous, and, like the Whale, bring forth their young alive, five or ſix at a birth, from a ſort of umbilical opening. In the belly of this fiſh is a ſort of eggs, ſome of them as large as a hen's egg: but they are ſoft, and have no white: the ſkin of moſt ſpecies of the Shark is hard, rough, and full of a vaſt number of prickles; and the fins are large, broad and thick; the mouth of the whole tribe of ſharks is not placed like that of any other kind of fiſh, but underneath a conſiderable long ſnout, which ſeems deſigned to prevent their deſtroying other fiſh in too great quantities: becauſe the Shark is obliged to turn upon its back when it would devour its prey; and was it not for the time it is turning, in which the purſued fiſhes eſcape, there is nothing that could avoid it; for it is very quick in ſwimming, has a vaſt ſtrength, with the largeſt ſwallow of any fiſh, and is very devouring. It is very fond of human fleſh, and has been known to attack and kill ſeveral fiſhermen in theſe ſeas.

But perhaps the moſt wonderful and terrible animal in nature is a ſea monſter, called the Great Sea Snake, or the Serpent of the Ocean, which, though ſeldom ſeen, ſometimes viſits the coaſt of Norway, and keeps continually at the bottom of the ſea, except in the months of July and Auguſt, which is its ſpawning time; and then it comes to the ſurface in calm weather, but plunges into the water ſo ſoon as the wind raiſes the leaſt wave.

According to the beſt accounts which Biſhop Pontoppidan could gather concerning this monſter, it will, at times, rear ſo much of its body out of the water, that its head will reach much higher than the main-top of any ſhip; and it will ſpout water out of its mouth like a Whale: the form of it is that of a Snake, the body is covered with ſcales, and the ſkin is uneven and wrinkled: it has two flaps, or perhaps broad fins, under its body, and is ſuppoſed to be 600 feet in length. It lies on the ſurface of the water in many folds; and there generally are, in a line with the head, ſome ſmall parts of the back to be ſeen above the ſurface of the water, when it moves or bends; and theſe at ſome diſtance, appear like ſo many caſks, or hogſheads, floating in a line, with a conſiderable diſtance between each of them; the eyes are very large, of a blue colour, and look like two large pewter plates. The whole animal is of a dark brown colour, but variegated with light ſtreaks or ſpots, that ſhine like a tortoiſe-ſhell. It has a kind of a mane, which looks like a parcel of ſea weeds, hanging down to the water edge; and, in its progreſs, it throws the water in ſuch agitation, that it runs round it like the current of a mill. It is ſaid, that this monſter will ſometimes raiſe up its head, and ſnap a man out of a boat; and it is affirmed, that it has been known to rear part of its body out of the water and throw it acroſs a veſſel of ſome hundred tons, and by its weight, ſunk it down to the bottom.

In theſe ſeas is alſo ſometimes to be ſeen an animal, which is called Kraken, and which, according to Biſhop Pontoppidan, is the largeſt ſea monſter in the world. This animal, as well as the great ſea Snake, appears to have been totally unknown to every writer of natural hiſtory, as well antient as modern, before the biſhop wrote: but this worthy prelate has been ſo induſtrious in making enquiries about thoſe animals, and examining into every particular concerning which he could receive intelligence, that he ſeems not only to put their exiſtence beyond doubt, but to throw ſuch conſiderable lights upon the ſubjects, as may lead future naturaliſts to a thorough knowledge of them.

The Kraken, the Biſhop obſerves, is one of the many great things which are in the ocean, concealed from our eyes, or only preſented to our view for a few minutes. The fiſhermen of Norway unanimouſly affirm, and without the leaſt variation in their accounts, that, when they row out ſeveral miles to ſea, particularly in hot weather; and by their ſituation expect to find 80 or 100 fathoms water, it often happens they do not find above 20 or 30, and ſometimes not ſo much. At theſe places, they generally find the greateſt plenty of fiſh, by which they judge the Kraken is at the bottom, which occaſions theſe unnatural ſhallows: there are ſometimes twenty boats or more got together, throwing out their lines at a moderate diſtance from each other: the only thing they have then to obſerve, is, whether the depth continues the ſame, which they will know by their lines; or whether it grows ſhallower. If this laſt be the caſe, they conclude that the Kraken is riſing nearer the ſurface; then they immediately take to their oars, and endeavour to get off as faſt as poſſible. When they have reached the uſual depth of the place, and find themſelves out of danger, they lie upon their oars; and, in a few minutes after, they ſee this enormous monſter come up to the ſurface of the water, where he ſhows himſelf ſufficiently,

ficiently, though his whole body does not appear, which, in all likelihood, no human eye ever beheld: its back or upper part, which ſeems to be about a mile and a half in circumference, ſome ſay more, looks at firſt, like a number of ſmall iſlands, ſurrounded with ſomething that floats or fluctuates, like ſea weeds. Here and there a larger riſing is obſerved like ſand banks, on which various kinds of ſmall fiſhes are ſeen continually leaping about, till they roll off into the water from the ſides of it; at laſt, ſeveral bright points or horns appear, which are thicker in proportion as they riſe above the ſurface of the water; and ſometimes they ſtand up as high and as large as the maſts of middle ſized veſſels.

Theſe are, it ſeems, the creatures arms, and it is ſaid that, if they were to lay hold of the largeſt man of war, they would pull it down to the bottom. After this monſter has been on the ſurface of the water a ſhort time, it begins to ſink again ſlowly; and then the danger is as great as before, becauſe the motion of his ſinking cauſes ſuch a ſwell in the ſea, and ſuch an eddy, or whirlpool, that it draws every thing down with it. As this enormous animal may be reckoned of the polype, or Star fiſh kind, it appears that the parts which are ſeen riſing at its pleaſure, and are called arms, are properly the tentacula, or feeling inſtruments, called horns, as well as arms, with which they move themſelves, and likewiſe gather their food.

Beſides theſe inſtruments for this laſt purpoſe, the creature has a ſtrong and peculiar ſcent, which it emits at certain times, and by which it draws other fiſh in heaps about it. It is alſo obſerved, that for ſome months, the Kraken is continually eating: and in other months he is voiding his excrements: during this evacuation, the ſurface of the water is coloured with the excrements, and appears thick and turbid. This muddineſs is ſaid to be ſo agreeable to the taſte or ſmell of other fiſhes, that they gather in prodigious numbers over the Kraken, when by his arms or horns he ſeizes and ſwallows them, and in time converts them by digeſtion into a bait for other fiſh of the ſame kind.

VEGETABLES *and* FOSSILS.

THESE countries afford no vegetables which merit any particular notice: but Sweden, in particular, abounds with various kinds of minerals and other foſſils; and among its mines there is one of ſilver, into which the workmen are let down in baſkets to the depth of above a hundred fathoms, where the roof of the mine is as high as a church, ſupported by vaſt arches of oak; and from thence they deſcend by ladders or baſkets to the loweſt part of the mine, at leaſt forty fathoms more. It is not known when this mine was firſt diſcovered, but it muſt have been wrought for many ages. The ore yields but indifferently, and requires great pains to refine it; however it annually produces about twenty thouſand crowns-worth of fine ſilver, of which the King has the pre-emption, paying one fourth leſs than the real value.

Several mines of ſilver and copper were diſcovered laſt century in the Swediſh Lapland.

Copper is found plentifully in ſeveral parts of Sweden, and is reckoned the fineſt in Europe. The moſt noted mine is of vaſt extent, and about eighty fathoms deep, but it is ſaid to have ſuffered much by the falling in of the roof; and the working of it is attended with great diſcouragement, from the large ſhare the crown has in the profit[*]. The copper made yearly out of this mine amounts to the value of two hundred thouſand pounds, whereof the King has a fourth part, and a duty upon the remainder of 25 *per cent.* when it is exported unwrought.

Copper is of all metals the moſt ductile and malleable after gold and ſilver, and abounds much in vitriol and ſulphur. It is found in glebes or ſtones of various forms and colours, which are firſt beaten ſmall and waſhed, to ſeparate all the earthy and impure parts wherewith they are mixed. After waſhing they are melted, and the metal run into a ſort of moulds, which form large blocks, by ſome called ſalmons, and by others cakes of copper. To render it more pure and beautiful, they melt it again once or twice, ſome of its coarſe extraneous parts being left at each fuſion, and a quantity of tin and antimony added; and in this ſtate it is called Roſe-copper.

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[*] Some years ago an Italian gentleman came into Sweden, with propoſals to make copper a ſhorter and cheaper way than had till then been practiſed, ſo as to make that in five days which before required three weeks, and with fewer hands, and one fifth part of the charcoal. The bargain was made, and his reward to be 100,000 crowns. His firſt eſſay ſucceeded to admiration; but when he came to work in earneſt, and had got his new-invented furnaces built to his mind, the miners, as he complained, picked out the worſt ore, and were otherwiſe ſo envious and untractable, that he failed of ſucceſs, and loſt his reward: nor was it without difficulty that he obtained leave to buy ore, and practiſe his invention at his own expence.

This metal is often found native in a malleable ſtate, ſometimes in beautiful branched forms or ſmall ſlender fibres, and ſometimes in little globular lumps, or maſſes of an irregular figure.

The mines of Sweden likewiſe afford vaſt quantities of excellent iron, of which, beſides what is manufactured in the country, they export yearly to the value of near three hundred thouſand pounds.

Of the nature of iron ore, or the manner of working it, nothing need be ſaid in this place, having given a ſufficient account thereof in ſpeaking of our iron works in the foreſt of Dean in Glouceſterſhire *.

The Magnet or Loadſtone, is found plentifully in the iron mines of Sweden, and indeed in all countries that have ſuch mines, though the beſt are ſaid to be brought from Bengal and China.

The Magnet is not properly to be conſidered as a diſtinct ſpecies of foſſils, being in reality

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* See Vol. I. p. 56. & *ſeq.*

nothing but a very rich iron ore, found in detached maſſes of various forms and ſizes, of a duſky iron grey, and often tinged with a browniſh or reddiſh colour. It is very heavy and hard, of an uneven ſurface, and of a firm ſtructure, but uſually with ſome porous irregularities within. It is endued with ſeveral extraordinary properties, as that of attracting iron, and directing its poles to thoſe of the world, upon which laſt property the mariner's compaſs is conſtructed *. Among the moſt remarkable properties and phænomena of the magnet are thoſe following. 1. Every magnet has

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*The honour of inventing the mariner's compaſs, is claimed by ſeveral nations. This is an inſtrument by which pilots direct the courſe of their ſhips, conſiſting of a box including a magnetical needle that always points nearly to the north. In the middle of the box is fixed a perpendicular pivot, which ſuſtains a card or paſte-board, on whoſe upper ſurface are deſcribed ſeveral concentric circles, the outermoſt whereof is divided into 360 degrees, and the other into 32 points, anſwering to ſo many winds, for which the ſeamen have different names. In the the centre of this card is a braſs cone or cap, a little concave, which is fitted to the middle of the needle, and plays freely on the pivot. It is covered with a glaſs, and the whole is incloſed in another box, where it is ſuſpended in ſuch a manner as to keep the needle horizontal. The needle is made of a thin plate of ſteel, in the form of a lozenge, or what is vulgarly called a diamond, and being rubbed on a good loadſtone, acquires the above-mentioned

has two poles, one of which points northwards, the other ſouthwards ; and if the magnet be
divided

tioned property of turning towards the north ; the exceeding uſefulneſs of which in navigation is very eaſy to conceive.

The power of the magnet or loadſtone to attract iron was known to the antients, and is mentioned by Plato, Ariſtotle, and Pliny ; but the knowledge of its directing power, whereby it diſpoſes its poles along the meridian of every place, and cauſes needles, pieces of iron, &c. touched with it, to point nearly north and ſouth, is of a much later date ; though the exact time of the diſcovery, and the perſon that made it, are yet unknown. Guyot de Provins, an old French poet, who lived in the twelfth century, ſeems plainly enough to hint at the uſe of the magnetic needle ; and the French lay claim to the invention of the compaſs from the fleur-de-lis, with which all nations diſtinguiſh the north point upon the card. With equal reaſon Dr. Wallis aſcribes it to the Engliſh, from its name compaſs, whereby moſt nations call it, and which, he obſerves, is uſed in ſeveral parts of England to ſignify a circle : but if the Engliſh are not intitled to the honour of the diſcovery, they have at leaſt the merit of having brought it to perfection by the method of ſuſpending the box which contains the needle. Some will have it, that Marco Paolo, a Venetian, having made a journey to China, brought back the invention with him in the year 1260 ; and what ſeems to confirm the conjecture is, that at firſt the Europeans uſed the compaſs in the ſame manner as the Chineſe ſtill do, i. e. they let it float on a piece of cork, inſtead of ſuſpending it on a pivot. There
is

divided into ever ſo many pieces, the two poles will be found in each piece. 2. One of theſe poles attracts, the other repels iron, but no other body. 3. The magnetic virtue is communicated to iron by the touch, and that very ſpeedily; though the longer the iron touches or joins the ſtone, the longer will its communicated virtue hold. 4. The magnet loſes none of its own virtue by what it communicates to the iron. 5. A piece of iron ſo touched by the loadſtone, and nicely ſuſpended on a ſharp point, will ſettle itſelf in a direction nearly north and ſouth. 6. The end touched with

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is ſome reaſon to think that our countryman, Roger Bacon, either diſcovered, or at leaſt knew of, the directive quality of the loadſtone: but after all, Flavio Gioia is the perſon who is uſually ſuppoſed to have conſtructed the firſt mariner's compaſs, about the year 1300, at Melfi in the kingdom of Naples.

The variation or declination of the magnetic needle from the true north point, either towards the eaſt or weſt, which is greater or leſs in different parts of the world, was firſt diſcovered in the year 1500, by Sebaſtian Cabot, a Venetian. The inclination or dipping of the needle, when hung ſo as to play vertically, to a point beneath the horizon, was the diſcovery of Mr. Robert Norman, an Engliſhman, about the year 1576. The variation of the variation, that is, a difference in the declination of the needle at different times in the ſame place, was firſt found out by another of our countrymen, Mr. Gellibrand, about the year 1634; though ſome aſcribe the diſcovery to Gaſſendus.

the ſouth pole of the ſtone will point northwards, and ſo *vice verſa*. 7. A ſtrong magnet, at the leaſt diſtance from a leſſer or a weaker, cannot draw to it a piece of iron adhering actually to ſuch leſſer or weaker ſtone; but if it comes to touch it, it can draw it from the other: and yet a weaker magnet, or even a little piece of iron, can draw away another piece contiguous to a greater or ſtronger loadſtone. 8. A plate of iron only, but no other body interpoſed, can hinder the operation of the magnet, either as to its attractive or directive quality. 9. The virtue of a loadſtone may be impaired by lying long in a wrong poſition *, as alſo by ruſt, wet, &c. and may be quite deſtroyed by fire. 10. A piece of iron-wire well touched, upon being bent round in a ring, or coiled round on a ſtick, will generally loſe its directive virtue, or at leaſt have it much diminiſhed; but if the whole length of the wire be not bent, ſo that the two ends be left ſtrait, the virtue will not be deſtroyed in thoſe parts, though it will in all the reſt. 11. A piece of wire that has been touched, being ſplit or cleft in two, the poles are ſometimes changed, as in a cleft magnet, the north becoming the ſouth, and the ſouth the north; and ſometimes one half of the wire will retain its former poles, and thoſe of the other half be changed. 12. By drawing the back of a knife, or a long piece of ſteel-wire, &c. leiſurely over the pole of a magnet, carrying the motion from the middle of the ſtone to the pole, the knife or wire will accordingly attract one end of the needle; but if the knife or wire be drawn from the pole to the middle of the ſtone, it will repel that end of the needle which in the other caſe it attracts. 13. If either a magnet or piece of iron be laid on a cork, ſo as to float freely in the water, it will be found, that which ſoever of the two is held in the hand, the other will be drawn towards it; ſo that iron attracts the magnet as much as it is attracted by it. 14. As the magnet communi-

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* Several ways have been tried, with little ſucceſs, for recovering the decayed virtue of loadſtones; but there is a remarkable experiment of this kind made by Mr. Haac, which anſwered the purpoſe ſo well that it deſerves to be mentioned. This gentleman had a loadſtone which would take up fourteen pounds and a half, but having laid it by for ſeveral years, he found it had loſt great part of its virtue; which he endeavoured to recover by ſeveral means, but without ſucceſs. At laſt he reflected, that by uſe and exerciſe the powers of animal bodies were often improved, and it might poſſibly happen ſo with reſpect to ſome properties or powers of inanimate bodies. Upon this thought he hung as much weight to the ſtone as it would ſuſtain, and ſo left it for the ſpace of ſome weeks. Then returning, he applied more weight to the former, which it eaſily bore; and thus by repeating the addition of more weight at ſeveral periods,

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periods, in about two years time the ſtone had not only recovered its former ſtrength, but increaſed it ſo far, that it would now take up more than twenty pounds.

cates its virtue to iron, ſo when armed, as they call it, or ſet in iron, it will take up a greater weight of it than it can alone*. 15. A knife, &c. touched with a magnet, acquires a greater or leſs degree of virtue, according to the part it is touched on. It receives the ſtrongeſt touch when it is drawn ſlowly from the handle towards the point over one of the poles of the magnet; and if the ſame knife thus touched, and in poſſeſſion of a ſtrong attractive power, be re-touched in a contrary direction, viz. by drawing it from the point towards the handle over the ſame pole, it immediately loſes all its virtue. 16. The magnet acts with the ſame force *in vacuo*, as in the open air†. Iron bars, by ſtanding long in an erect poſition, acquire a magnetic virtue to a ſurpriſing degree, the lower end of ſuch bars being

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* It is likewiſe obſervable, that the power or force of magnets is generally greater in ſmall than in large ones, in proportion to their bulk. Thoſe of a large ſize will rarely take up more iron than three or four times their own weight; whereas if ſmall ones do not take up more than eight, ten, or twelve times their weight, they are reckoned but indifferent. A gentleman at Bruton in Somerſetſhire has a magnet, whoſe weight, with the armature, is but 43 grains, and yet will take up 1032 grains, which is 24 times its weight: and we have heard of another gentleman who wears one in his ring, that ſcarce weighs three grains, and will take up near 750 grains, which is 250 times its weight; but this is an inſtance hardly to be paralleled.

† Theſe are the principal phænomena of the magnet; but to account for the manner in which they

they are produced, we have yet no ſatisfactory hypotheſis. Some of the ancients aſcribe the action of the magnet to a ſoul that animates it, and others to a certain ſympathy between the effluvia of iron and thoſe of the magnet. The chief opinion that prevails among the moderns is that of Des Cartes, maintained by Malebranche, Rohault, &c. and even admitted and confirmed by Mr. Boyle and other great philoſophers. This ſuppoſes a ſubtle, impalpable, and inviſible matter, ſtriated or channelled, continually circulating round the earth in the planes of the meridians, re-entring at the pole oppoſite to that from which it iſſued, and ſo paſſing through the earth in a direction parallel to its axis. The magnet, it is imagined, has two poles anſwerable to thoſe of the earth, and out of theſe iſſues a matter like that juſt mentioned, which gives the impulſe whereby iron tends to the magnet, and produces what we call attraction. Now beſides the matter re-entering the poles, there is a quantity of it continually circulating round the magnet, and forming a kind of vortex; and the ſpaces wherein this matter moves is the ſphere of the magnet's activity, within which its attractive faculty is confined. The eſſence of a magnet therefore is ſuppoſed to conſiſt in its being perforated by an infinite number of parallel pores, ſome whereof are diſpoſed to admit the ſtriated matter from the north pole of the world, others that of the ſouth; and hence the north and ſouth poles of the magnet.

Mr. Whiſton takes the directive power of the loadſtone to be mechanical, aſcribing it to the circulating being the north pole, and the upper the ſouthern. Nay, tongs and pokers, by being often heated, and ſet to cool again in a poſture nearly erect, have acquired this wonderful property, which is alſo communicated to iron by a ſtrong attrition all one way.

There is a ſort of ſtone found in Sweden, which yields ſulphur, vitriol, alum, and minium, whereof Sir Gilbert Talbot has given us the following account. It is ponderous, and of a yellow colour, intermixed with ſtreaks of white, as if compoſed of gold and ſilver. It runs in veins among the rocks, on which they lay wood and ſet it on fire; and when the ſtone is heated they throw water upon it to make it rend, and dig it up with mattocks. They afterwards break it into ſmaller pieces, and melt it in ovens, in iron pots, which are placed ſloping, ſo that the melted matter may run out of one pot into another ſet to receive it at the mouth of the oven. This running of the ſtone is ſulphur; and the remaining maſs is carried out, and laid on a hill, where it is expoſed to the ſun and air for two years. It then takes fire of itſelf, yielding a thin blue

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culating effluvia, of which he thinks there are evident indications in magnetic experiments; as Mr. Boyle thinks there are of the magnetic effluvia of the earth, though they were never yet rendered ſenſible: but the attractive power Mr. Whiſton ſuppoſes entirely immechanical, like the power of gravity.

flame, ſcarce diſcernible in the day-time, and leaving a blue duſt behind it; which the workmen obſerving, they dig it up, and put it into great tubs of water, to infuſe for twenty-four hours. The water is afterwards boiled in kettles, and put into cooling tubs, wherein croſs ſticks are placed, on which the vitriol faſtens like ſugar-candy. What remains of the water, after the extraction of the vitriol, is mixed with an eighth part of urine and the lees of wood-aſhes, which being again boiled very ſtrong, and ſet to cool in tubs, the ſticks placed in them are incruſted with alum. In the water that remains after the alum there is found a ſediment, which being ſeparated from the water, and burnt in an oven, becomes red, and is the minium wherewith they paint their houſes *.

In Denmark and Norway are ſeveral mines of iron and other metals; and in the iſland of Iceland is found a foſſile, thence called Iſland Cryſtal, but very improperly, as it has none of the diſtinguiſhing characters of cryſtal, and is plainly a body of another claſs; being a pellucid fiſſile ſtone, chiefly dug out of the mountains of Iceland, though likewiſe to be

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* What we commonly call minium, or red lead, is a preparation of lead, made by melting the metal in an unglazed earthen pan, and ſtirring it till it be reduced firſt to a blackiſh, then yellowiſh, and laſtly to a very red powder, which is of ſome uſe in medicine, but of more in painting.

met with in France and Germany. Its form is very regular, being always an oblique parallelopiped compoſed of ſix planes; but its ſizes are various, from a quarter of an inch to three inches in diameter, though its moſt uſual ſtandard is about two inches and a half. It is uſually found in ſingle maſſes, except in Iceland, where it is ſometimes found in complex maſſes of a great breadth; but theſe are evidently made up of a number of the perfect ſingle ſpecimens, placed ſide by ſide in a beautiful and orderly arrangement. This ſtone has a ſingular property, of ſplitting with the ſame eaſe either horizontally or perpendicularly; which is owing to the regular figure, the ſmooth ſurface, and nice joining of the ſeveral ſmall concretions of which it is compoſed. Writers on optics have taken much notice of this ſtone, and its uſual phænomena have been accurately examined by Eraſmus, Bartholin, Huygens, and Sir Iſaac Newton; but neither its nature or texture ſeems to have been perfectly underſtood, moſt writers having accounted it a cryſtal, and Sir Iſaac a ſpecies of talc; whereas in reality it is a true and genuine ſpar, though in brightneſs it does not fall much ſhort of the pureſt cryſtal, being perfectly clear, and very ſeldom blemiſhed with flaws or ſpots, or ſtained with any other colour. The remarkable property of this body, for which it is ſo famous amongſt opticians, is its double refraction; ſo that if it be laid over a black line drawn on a piece of paper, the line appears through it double, or two lines appear inſtead of one, both of the ſame ſtrength of colour and thickneſs, and running parallel to one another at a ſmall diſtance. This effect is beſt ſeen through the plain horizontal ſurfaces of the ſtone, and there are ſome angles in which it is not produced. If a ray of light fall on this ſtone either perpendicularly or obliquely, it is divided into two by means of the ſame double refraction; and the like is obſerved in rock cryſtal, though in a leſs ſenſible degree.

The ſame kind of ſtone is found in the iſles of Farro, where they have likewiſe ſome talc, and two ſorts of ſalt-petre, but in no great quantity. On the ſea ſhore they likewiſe find a ſort of tranſparent ſtones, ſo hard that one may write with them upon glaſs. Some are white with a ſmall mixture of blue, others yellow, and ſo well poliſhed that they ſerve to put in rings. They grow in clifts of the rocks, from whence they are waſhed by the waves; but they are not much eſteemed, and are ſaid to loſe their colour when tranſported.

MOUNTAINS, LAKES, SPRINGS, CATARACTS, *and* WHIRLPOOLS.

THE moſt remarkable mountain in theſe countries is a celebrated Volcano, called Mount Hecla, ſituated in the ſouth-eaſt part of the iſland of Iceland. This Volcano not only vomits forth flames, but ſtreams of a ſulphureous liquid, which burns like ſpirit of wine. It alſo throws up prodigious quantities of black aſhes and pumice ſtones; and it is obſervable, that the eruptions of this mountain ſcarce ever happen when the wind is at weſt. Then the natives, who are acquainted with the way, mount up to the very top of the Volcano, from whence the flames iſſue but this is attended with ſome conſiderable danger, eſpecially to ſuch as do not thoroughly know the road: for it is ſaid, that the earth, being undermined by the ſubterraneous fire, ſometimes falls in under the leaſt conſiderable weight. Beſides mount Hecla, there are other Volcanos in Iceland, which are all covered with ſnow.

From the mountains of Sweden fall innumerable rivers, or rather torrents: but few of them are navigable on account of the rocks and Cataracts that obſtruct their paſſage; and theſe rivers form ſeveral great lakes, ſome of which are eighty miles in length, and upwards of twenty in breadth.

Amongſt the lakes of Sweden, that called Vetter is ſo remarkable in many reſpects, that it ought by no means to eſcape notice. It divides Eaſt and Weſt Gothland, being in length from north to ſouth above eighty miles, and about eighteen broad in the middle, growing narrower towards each extremity. The water of this lake is very clear, and in ſome places ſo deep, that it has been ſounded with three hundred fathoms of line without finding the bottom. For the moſt part it is free from rocks, and has but few iſlands, the principal of which is Viſingſoe, lying in the middle of the lake. It is often diſturbed by ſtorms, and ſometimes ſo ſuddenly, that the ſurface begins to be ruffled before the leaſt breath of wind is perceived, ſo that the cauſe ſeems to proceed from the bottom of the waters; and it is no uncommon thing for boats to be toſſed by a ſtorm in one part of the lake, whilſt others not far off are in a perfect calm. That ſuch eruptions and agitations of the waters are promoted by ſubterraneous winds, ſeems to be confirmed by various phænomena; for immediately before a ſtorm, and whilſt the ſky is yet clear, there is perceived a noiſe like thunder in the lake, which Dr. Hearne tells us he has often heard himſelf, and which was always followed by a tempeſt. Of this the inhabitants of Viſingſoe are more ſenſible than any others, for from that part of the iſland whence the wind will blow the next day, they hear a confuſed noiſe like the firing of cannon; and when this rumbling is heard in the eaſt, it is generally followed by rain and hail. Some people have likewiſe obſerved, while the water has been very calm, a great number of little clouds, like ſo many darts, riſing up here and there from the bottom of the lake, which uniting in the air formed a mizzling rain; whence it plainly appears, that this is much owing to ſubterraneous winds. To ſuch winds undoubtedly, together with thoſe from above, we may attribute the ſudden thawing of the ice in the ſpring, which one minute is ſtrong enough to bear horſes and ſledges, and the next is broken to pieces. The ſtrange grumbling of the waters, which precedes this terrible eruption, warns travellers to make the beſt of their way; but thoſe who happen to be at a great diſtance from land are certainly drowned, or float upon ſhoals of ice till they meet with relief: and what is ſtill more dangerous, the ice ſometimes with the leaſt blaſt of wind ſinks ſuddenly to the bottom.

The violent under-currents of water obſerved in this lake are alſo very ſurprizing, which directly oppoſing the winds and waves give the fiſhermen a great deal of trouble. From theſe, as well as from its unfathomable depth and ſubterraneous winds, it is ſuppoſed to have a communication under ground with another large lake called Venner, about forty miles to the weſtward; and this ſeems to be confirmed by ſeveral whirlpools that lie between theſe lakes, two of which have been ſounded and found of a vaſt depth. What farther countenances this opinion is, that ſome years without any viſible cauſe, the waters increaſe, and decreaſe again the following years, as ſeveral curious perſons have obſerved.

There is a ſpring not far from the lake Vetter, called the Hungry or Prophetic Fountain, becauſe they ſay it never has plenty of water but when there is a ſcarcity of corn the following year. It lies in a valley encompaſſed with ſandy hills, and has this peculiarity, that in a rainy ſummer it is commonly dry, whereas in the drieſt ſummers it ſometimes overflows the highway near Vadſtein. In 1685, which was a very wet year, this ſpring was quite dried up; but the next ſummer, which was not ſo rainy, it was obſerved to increaſe: and in the very dry ſummer of the year 1705, when all the neighbouring ſprings entirely failed, this had a plentiful ſtream of water.

Cataracts, as has been obſerved already, are frequent in the rivers of Sweden; but the moſt remarkable is that within a few leagues of Gottenburg; where a river, which iſſues from the lake Venner, falls down a prodigious high precipice into a deep pit, with a terrible noiſe, and with ſuch violence, that large maſts, which are floated down the river to Gottenburg, frequently dive ſo far under water by the fall, if they happen to pitch endwiſe, that ſome are half an hour, others three quarters, and ſome a whole hour or more, before they riſe up again to the ſurface. Many attempts have been made to find the depth of this hole, into which the river falls here, but no bottom could ever be diſcovered.

Near the coaſt of Norway, about 68 degrees of latitude, there is a vaſt whirlpool, commonly called Maelſtrom, and by mariners the navel of the ſea, which proves fatal to ſhips that approach too near it, during the time of flood; for then the ſea, upwards of two leagues round, forms ſuch a terrible vortex, that the indraught of the water and the noiſe of the waves are not eaſy to be deſcribed or imagined; and during the ebb the water is thrown out with ſuch violence, that the heavieſt bodies caſt into it cannot ſink to the bottom, but are toſſed up to the ſurface with great impetuoſity. Veſſels ſwallowed by this whirlpool, are caſt up again ſhattered to pieces, being daſhed againſt the rocks within it; but there is an interval between flood and ebb, during which, the water is ſo ſtill, that ſhips may ſail over it without danger.

We are apt to think, however, that ſome accounts of this whirlpool are too much mixed with fable; eſpecially as we are told by Francis Neri, an Italian, who travelled into Norway, that what is repreſented as a whirlpool, is only a rapid current, which makes a great noiſe during the ſix hours of flood, occaſioned by the water's daſhing violently againſt ſeveral ſmall iſlands or rocks, which repel the ſtream different ways, and ſometimes give it a whirling motion; but that during the time of ebb, ſmall boats may paſs ſafely from one iſland to another.

The account we have of the whirlpool about the iſlands of Farro, ſeems better atteſted, being given us by Mr. Jacobſon Debes, provoſt of the churches in thoſe iſlands. The moſt dangerous is that which lies ſouth of Suderoe, near a rock called the Monk, where ſeveral veſſels have been ſwallowed up. The ſea round this whirlpool is eighty or ninety fathoms deep, and the ſurface of the water is ſmooth and ſtill: but a little farther in, the ground lies at the depth of twenty-five or thirty fathoms, where the ſea begins to riſe and turn round. Within this the ground lies from eight to ten or twelve fathoms deep, in four circles; and this high ground riſes up in points or clifts, which are about eight fathoms under water, and about twelve diſtant from each other. Between theſe circles are three channels from twenty-five to thirty fathoms deep, wherein the ſea runs round; and within all the circles there is a hole, the depth of which in the middle is above ſixty fathoms. The innermoſt current turns round but ſlowly, but the others with great ſwiftneſs. On the ſouth ſide of this hole the rock called the Monk, riſes ten fathoms above water, and north of this there are ſix leſſer rocks, on the top of which our author obſerves, the compaſs runs round like the whirlpool. Conſidering the danger that veſſels run by approaching this vortex, the reader perhaps may wonder how ſo particular a deſcription of it could be taken; but our author informs us, that in very calm weather, during the reflux of the ſea, the inhabitants venture to fiſh there, and to climb the rocks.

In Iceland there are many remarkable ſprings, ſome of them ſo hot as to ſcald the hand, or even to boil a piece of beef, according to Dr. Biornoni, in a quarter of an hour; and about the brims of the ſprings theſe waters harden and petrify. Blefkenius relates, that in the weſtern part of the iſland there is a lake which ſmoaks continually, and is of a petrifying quality; ſo that if a piece of wood be ſtuck into it, the part under water becomes ſtony, and that in the ground turns to iron. This, he tells us, he twice experienced; but adds, that what ſeemed to be iron, being thrown into the fire, burnt like charcoal. He alſo mentions another lake in the middle of the iſland, which exhales ſo poiſonous a vapour as to kill birds that fly near its ſurface. The ſame author takes notice of two ſprings, the one hot, the other cold, the waters whereof form an excellent bath, being conveyed by different channels into one and the ſame baſon: and near theſe ſprings there is another, the water of which taſtes like wheat, and is excellent againſt the venereal diſtemper.

SECT. III.

An Hiſtorical Account of the moſt remarkable public Calamities, which, at different times, have viſited the Inhabitants of Denmark, Norway, *and* Sweden.

THE iſland of Northſtrand, near the dutchy of Sleſwick in Denmark, is ſaid to have been originally ſeparated from the continent by a violent ſtorm: but the time when that happened does not appear. It has however, at different times, ſuffered prodigiouſly by dreadful inundations; particularly, in the year 1300, the little city of Rungholt, with ſeveral churches and villages, were ſwept away by the ſea, which alſo deſtroyed vaſt numbers of people and cattle.

On the 2d of November 1532, a dreadful ſtorm aroſe, in which the whole iſland was overflowed by the ſea, and near two thouſand perſons periſhed in the waters; the year following, another ſtorm damaged the dikes very much; and from the year 1612 to 1618, there happened annually ſuch inundations as almoſt depopulated the iſland.

On the 11th of October 1634, there aroſe a ſtorm, by which the whole iſland was laid under water, ſix thouſand perſons were drowned, about fifty thouſand head of cattle were loſt, and the iſland totally deſolated.

The city of Rypen, in North Jutland, has been frequently expoſed to the moſt imminent danger by the tide's flowing into the harbour, with prodigious violence, from the ſea: and during the dreadful ſtorm of 1634, which proved ſo fatal to Northſtrand, this city was almoſt totally laid under water.

Among the miſchiefs done by the ſnow-falls in Norway, the greateſt generally is, when a maſs of ſnow, falling from a precipice, overwhelms both men and cattle, overſets boats in the lakes, and, which is but too often the caſe, demoliſhes cottages and houſes, inſomuch that even whole villages are borne down, cruſhed, and totally deſtroyed. Theſe ſnow-falls are of two kinds: the firſt is, when, in froſty weather, the light ſnow is ſuddenly ſet in motion, and in its progreſs ſcattered all over the country. This fall of ſnow is not attended with ſuch damages as the other, which happens when, by the miſts and rains in the ſpring, the conſolidated ſnow falls in a maſs, bearing down every thing in its way, even the ſtrongeſt buildings. By a ſnow-fall of the firſt kind, a whole pariſh in this country, about a century or two ago, was wholly covered, and remains ſo to this day; the ſnow which had thus fallen from the adjacent mountains, not diſſolving the year after, was farther gradually increaſed and hardened by lying; the ſituation being high, and hemmed in among the mountains.

A calamity which ſometimes happens in Norway, is the ſudden diſruption of a rock; by which great damages are done to the cattle, fields, woods; and ſometimes houſes and families are involved in the deſtruction.

In the year 1679 a diſruption of this ſort happened in the dioceſe of Bergen, by which many cultivated tracts of land were deſtroyed, ſeveral houſes demoliſhed, and 130 perſons periſhed; and all this as ſuddenly as in other countries by earthquakes.

SECT. IV.

An Account of the moſt celebrated Inventions, Diſcoveries, &c. of the Inhabitants of Denmark, Norway *and* Sweden.

AMONG the philoſophers of theſe countries, Tycho Brahe, a nobleman of Denmark, who was born in 1546, appears to be the moſt celebrated, for his knowledge in aſtronomy; more eſpecially for his catalogue of the ſtars, and that order or arrangement of the heavenly bodies, called from him, the Tychonic ſyſtem, or hypotheſis.

This philoſopher, though he approved of the Copernican ſyſtem, yet could not reconcile himſelf to the motion of the earth; and being on the other hand convinced, the Ptolemaic ſcheme could not be true, he contrived one different from either, and of an intermediate nature between the Copernican and Ptolemaic, or participating alike of them both. In the Tychonic ſyſtem, the earth has no motion allowed it; but the annual and diurnal phænomena are ſolved by the motion of the ſun about the earth, as in the Ptolemaic ſcheme; and thoſe of Mercury and Venus are ſolved by this contrivance, though not in the ſame manner, nor ſo ſimply and naturally as in the Copernican ſyſtem. The Tychonic ſyſtem then ſuppoſed the earth in the center of the world, that is, of the firmament of ſtars, and alſo of the orbits of the ſun and moon; but at the ſame time it made the ſun the center of the planetary motions, viz. of the orbits of mercury, venus, mars, jupiter, and ſaturn. Thus the ſun, with all its planets, was made to revolve about the earth once a year, to ſolve the phænomena ariſing from the annual motion, and every twenty-four hours, to account for thoſe of the diurnal motion. But this hypotheſis is ſo monſtrouſly abſurd, and contrary to the great ſimplicity of nature, and, in ſome reſpects, even contradictory to appearances, that it obtained but little credit, and ſoon gave way to the Copernican ſyſtem.

After this ſcheme had been propoſed for ſome time, it received a correction, by allowing the earth a motion about its axis to account for the diurnal phænomena of the heavens; and ſo this came to be called the ſemi-Tychonic ſyſtem. But this was ſtill void of the truth, and encumbered with ſuch hypotheſes, as the true mathematician and the genuine philoſopher could never reliſh.

The little iſland Huen, or Ween, lying in the ſound, about half a league from the coaſt of Schonen, was given this celebrated aſtronomer by king Frederic the Second of Denmark, whoſe generoſity likewiſe ſupplied him with money to erect an edifice in the middle of it, and to furniſh it with all proper inſtruments for obſerving the courſe and motions of the heavenly bodies. Accordingly, about the year 1576, the noble Dane laid the foundation of a magnificent caſtle, which he called Uraniburg, or the city of the heavens, and in a few years the ſtructure was compleated, wherein every thing was ſo well contrived both for pleaſure and convenience, and the inſtruments ſo excellent for making aſtronomical obſervations, that it was looked upon as the fineſt obſervatory in the world *. Here Tycho compoſed his catalogue of ſtars † ; but by the fate of war between Sweden and Denmark, ſome-

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* The moſt celebrated obſervatories at preſent are thoſe of Greenwich and Paris, both of royal foundation, the former being built by order of king Charles II. at the ſolicitation of Sir Jonas Moor and Sir Chriſtopher Wren, and the latter by Louis XIV. and both furniſhed with the moſt accurate inſtruments.

Father le Comte gives an account of a magnificent obſervatory erected in China by the late emperor, at the requeſt of ſome jeſuit miſſionaries, eſpecially father Verbieſt, whom he made his chief obſerver. The inſtruments he ſays, are very large, but the diviſions leſs accurate, and the contrivance in ſome reſpects leſs commodious than thoſe of the European obſervatories.

† It would be impoſſible to have any diſtinct or regular notion of the ſtars, with reſpect to their number, order, diſtances, &c. without firſt reducing them to proper claſſes, and arranging them in certain forms, under the names of animals or other

ſometimes the one, and ſometimes the other being maſters of this iſland, this famed obſervatory

other things, as the ram, the bull, the crown, &c. which are called Conſtellations. By this means aſtronomers are enabled to form catalogues of the ſtars, and to record their places in the heavens; and thus the obſervations of the antient and modern aſtronomers may be compared together. Hipparchus, about one hundred and twenty years before Chriſt, is ſaid to be the firſt who framed a catalogue of the ſtars, in which he made uſe of the obſervations of ſome preceding aſtronomers; and his catalogue, which contained 1026, was afterwards copied by Ptolemy, and adjuſted to his own time. In the year 1437, Ulugh Beigh made a new catalogue of 1022 ſtars, which has been tranſlated out of Perſian into Latin by Dr. Hyde. The next who made a catalogue of ſtars from his own obſervations, was Tycho Brahe, who rectified the places of 777 ſtars for the year 1600; which Kepler increaſed to 1000, from other obſervations of the ſame aſtronomer. Bayer publiſhed a catalogue of 1160. Hevelius compoſed one of 1888 ſtars, adjuſted to the year 1660, but only ſix hundred and three of thoſe from his own obſervations. The laſt and moſt compleat of all is the Britiſh catalogue, compiled from the obſervations of the accurate Mr. Flamſteed, the firſt aſtronomer to whom the royal obſervatory at Greenwich was committed, and who, as Dr. Halley expreſſes it, ſeemed born for the employment. Here this great man applied himſelf with unwearied pains to obſerve the heavenly bodies for a long courſe of years; but though his obſervations were very numerous, and his papers ſwelled to a great bulk, nothing appeared from ſervatory did not ſubſiſt above twenty years, and there are now ſcarce any footſteps of it remaining, the ruins having been diſperſed into divers places, though part of them ſerved afterwards to build Tycho a handſome ſeat upon his ancient eſtate, which to this day retains the name of Uraniburg.

When Dr. Oliver viſited the iſland of Ween, which he ſays is not above three miles in circumference, he found no remains of Tycho's caſtle, but part of a circular ſtone wall, by

him in public worthy ſo much expence and preparation. This occaſioned prince George of Denmark to appoint Sir Iſaac Newton, Dr. Gregory, Dr. Arbuthnot, and other members of the royal ſociety, to inſpect Mr. Flamſteed's papers, and chuſe out of them ſuch as they ſhould think fit for the preſs, purpoſing to print them at his own expence: but the patron dying before the impreſſion was half finiſhed, it lay ſtill for ſome time, till at length it was reſumed by order of queen Anne, and the care of the preſs committed to Dr. Arbuthnot, and that of correcting and ſupplying the copy to Dr. Halley, Mr. Flamſteed's ſucceſſor in the royal obſervatory. Such was the riſe and progreſs of the *Hiſtoria cæleſtis*, wherein we have a catalogue of about 3000 ſtars, diſtinguiſhed into ſeven degrees of magnitude, in their proper conſtellations, with their longitudes, latitudes, &c. but ſcarce one thouſand of theſe are at any time viſible to the naked eye. This catalogue is rectified for the year 1689; and as nothing was wanting either in the apparatus or obſerver, it may be looked upon, ſo far as it goes, as a perfect work.

which the obſervatory was ſeparated from the other apartments. As to the fine apparatus of this aſtronomer, the doctor tells us, that moſt of the inſtruments are ſcattered up and down in Germany, though ſome few were ſtill remaining at Copenhagen when he was there; and in particular he ſaw in the round tower, Tycho Brahe's own celeſtial globe, which was ſix feet nine inches in diameter. This tower, he adds, was built in 1601, near the royal college in Copenhagen, for making aſtronomical obſervations, and is above a hundred and fifty feet high. The diameter of the area at top is ſixty feet, and the paſſage up to it wide enough for two coaches, which winding with an eaſy and almoſt imperceptible aſcent, it ſometimes ſerved as a place of parade for the gentry to take the air, as well as for an obſervatory.

Charles Linnæus, the celebrated naturaliſt, is a native of Sweden. This great philoſopher, who was born in 1707, and is now profeſſor of phyſic and botany, at Upſal in Sweden, is well known for his new and accurate ſyſtem of natural hiſtory; but more eſpecially for his ſyſtem of botany, which is now univerſally followed. The ſyſtem of botany, which is entirely new, is founded on the number and different ſtructure obſervable in the male and female part of generation of each plant; the former of which is called ſtamen, or ſtamina, when there are more than one of them; and the latter piſtil.

From the number and ſituation of the ſtamina, he has arranged the whole family of plants under twenty-four claſſes, viz. 1. The *Monandria*. 2. *Diandria*. 3. *Triandria*. 4. *Tetrandria*. 5. *Pentandria*. 6. *Hexandria*. 7. *Heptandria*. 8. *Octandria*. 9. *Enneandria*. 10. *Decandria*. 11. *Dodecandria*. 12. *Icoſandria*. 13. *Polyandria*. 14. *Didynamia*. 15. *Tetradynamia*. 16. *Monadelphia*. 17. *Diadelphia*. 18. *Polyadelphia*. 19. *Syngeneſia*. 20. *Gynandria*. 21. *Monoecia*. 22. *Dioecia*. 23. *Polygamia*, 24. *Cryptogamia*.

Theſe are the general claſſes of plants, eſtabliſhed by that excellent botaniſt; who farther ſubdivides them into orders, which he denominates *monogynia*, *digynia*, *trigynia*, &c. from the number of piſtils, or female parts of generation, found in each plant.

The ſame celebrated naturaliſt has likewiſe diſtributed the vegetable part of the creation into different orders, from the form and ſtructure of the calyx, or cup, of their flowers; but as this has no connection with the method laid down, we muſt refer ~~the~~ readers to his *Genera Plantarum*, where they will find it explained.

SECT. V.

Particular Deſcriptions of the moſt remarkable public Buildings, and other ſingular Productions of Art, in Denmark, Norway, *and* Sweden.

THE cathedral of Roſchild in Zeland, once the capital of Denmark, and a biſhop's ſee, is an old but ſtately ſtructure, chiefly noted for being the burial-place of the royal family. Here are the tombs of many of the Daniſh kings, ſome of which are very magnificent; and over the altar is a fine piece of gilt carved work, repreſenting the hiſtory of our Saviour's paſſion.

The cathedral of Rypen is a noble pile, built with free-ſtone, and covered with lead, and has a lofty ſquare ſteeple. The marble columns which ſupport its roof, and ſome royal tombs, are its principal ornaments.

The cathedral of Aarhus, is of curious architecture, and adorned with many fine monuments of prelates, noblemen, and other perſons of diſtinction.

As to the palaces of the king of Denmark, that at Copenhagen, having been deſtroyed by fire in 1728, is now rebuilt in a magnificent manner: but the palace of Frederickſburg is the moſt beautiful and delightful of any belonging to that monarch. This palace ſtands on an iſland, in the middle of a little lake, and was formerly a ſeat belonging to a private gentleman; but king Frederic the ſecond, being charmed with its ſituation, bought it, and began to enlarge it, and it was finiſhed by his ſon Chriſtian the fourth. The building ſtands on piles, conſiſting of a very majeſtic front, and two large wings, which contain ſeveral grand apartments. The gallery that leads to the hall of audience, is filled with a fine collection of paintings, moſt of them brought from Italy; and the hall is adorned with pictures of ſeveral of the Daniſh kings, and of the preſent royal family, as large as the life. The exploits of ſome of theſe monarchs, are alſo beautifully painted in different parts of the palace, and the great actions of Chriſtian the fourth, are repreſented in rich tapeſtry. The chapel is covered with gilt copper, and the inſide is embelliſhed with paintings and other ornaments, amongſt which are the ſtatues of the twelve apoſtles in ſilver; and it is ſaid the locks, bolts, &c. were all of ſilver, before it was plundered by the Swedes. There is a fine garden behind the palace, and in the lake they have raiſed a ſort of terrace on piles, which coſt a hundred thouſand crowns. The neighbouring park is about nine miles long, agreeably interſperſed with canals, and fiſh-ponds, and well ſtocked with fallow-deer from England.

The caſtle of Gottorp, belonging to the duke of Holſtein, is at the ſame time a fortreſs, and one of the nobleſt palaces in theſe northern countries. It ſtands to the weſt of the river Sley, in the middle of a ſmall lake, and is built in the form of an oblong ſquare, and fortified with four baſtions of earth. A rampart encompaſſes the firſt court, and the gate of the caſtle is of a fine blue ſtone, as hard as marble. On the north ſide of the caſtle there is a bridge over the lake, two hundred paces in length, and at the end of the bridge, a fine walk between rows of trees leads to the garden, which is adorned with caſcades, fountains, and other water-works. In particular there is a large baſon or fiſh-pond, with pleaſant arbours on the ſides of it, and in the middle is a ſtatue of Hercules combating the Hydra, whoſe heads ſpout out water. On the north there is a parterre in form of a creſcent, divided into Compartments, and embelliſhed with the buſts of ſeveral kings and princes. But one of the moſt curious ornaments of theſe gardens is a fine globe of copper, ten feet and a half in diameter, with a ſphere exhibiting the motion of the ſun, and heavenly bodies, which are carried round in exact order, by means of certain wheels turned by water. Before the houſe is a level piece of ground, about an hundred and fifty paces long, which is divided into three parts; thoſe on the ſides being two fine parterres, and that in the middle having a large baſon in the center, with beautiful water-works. From hence there is an aſcent to different terraces, one above another, ſet round with ſtatues, buſts, and other ornaments. From the higheſt terrace there is a charming proſpect. On the left there is a noble orangery or green-houſe, and in the neighbourhood is a pleaſant park, four or five miles in circumference, well ſtocked with deer.

The royal muſeum at Copenhagen, contains a noble collection of curioſities, both natural and artificial. Dr. Oliver informs us, that this fine collection is preſerved in eight chambers, built over the royal library, which is large and well furniſhed. One of theſe rooms is wholly taken up with medals, antique and modern, each ſort being kept by themſelves, and very judiciouſly arranged; and in a ſeparate caſe are contained the Paduans *, and other counterfeit medals, which in workmanſhip ſo nearly reſemble the true Grecian and Roman antiques, that a good judge can ſcarce

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* A Paduan, among medalliſts, is a modern medal ſtruck with all the marks and characters of antiquity. The name is taken from a famous Italian painter, called the Paduan, from Padua the place of his birth, who ſucceeded ſo well in the cheat, that the beſt judges are at a loſs to diſtinguiſh his medals from thoſe which are really antique. His ſon Octavian, though born at Rome, was alſo called the Paduan. Laurentius Parmeſanus and Bellus Vicentinus in Italy, and Carteron in Holland, had likewiſe the art of imitating antique medals in great perfection.

diſtinguiſh them from originals. The ſeries of the modern medals of European nations are abſolutely compleat, and thoſe of each nation kept diſtinctly.

Amongſt the natural curioſities preſerved in the chambers, one of the moſt remarkable is a petrified child, the hiſtory whereof has been given us at large by Bartholine, Licetus, and other authors. This child was cut out of the mother's belly at Sens in Champagne, in the year 1582, after having lain there between twenty and thirty years; and that it is a human fœtus, and not artificial, is evident beyond all diſpute. Its head, ſhoulders, and belly, are of a whitiſh colour, and very much reſemble alabaſter; the back and loins are ſomewhat brown and harder; but from the hips downwards it is of a red colour, and as hard and perfect ſtone as can be, exactly reſembling the hard ſort of ſtones generated in the bladder. This fœtus, after it was taken from the mother, was firſt carried to Paris, where it was ſold to a jeweller of Venice, who happened to be there, for about twenty pounds ſterling; of whom it was afterwards purchaſed by Frederick the Third, king of Denmark, for ſixty pounds, and added to this collection.

In one of the chambers are to be ſeen two elephant's teeth, each weighing a hundred and fifty pounds, which were dug out of a ſtone quarry in Saxony.

Here is alſo an egg laid by a woman, about the ſize of a common pullet's egg, which Olaus Wormius tells us was ſent him by very good hands, and the truth of the fact confirmed by people of credit. The woman, he ſays, brought forth two eggs, with the uſual child-birth pains; but the neighbours, who were called in to her aſſiſtance, broke the firſt, wherein they found a yolk and a white, as in that of a hen *.

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* As ſtrange as this may ſeem to thoſe who are unacquainted with the animal oeconomy, we have abundant teſtimonies to confirm the truth of ſuch productions; and indeed the generation of all ſorts of animals *ab ovo*, from eggs, is ſtrenuouſly aſſerted by Harvey, de Graaf, and other great anatomiſts. M. Olivier, a phyſician at Breſt in France, atteſts, that in the year 1684, a woman who had been pregnant ſeven months, was brought to bed of a whole plate full of eggs, faſtened together like a bunch of grapes, and of various ſizes, from that of a lentil to that of a pigeon's egg. Bonetus, in a letter to Zuingerus, mentions a young maid who had brought forth a great number of little eggs; and Virdungius relates, that in diſſecting a woman who had a rupture, he found eggs of divers ſizes in the cornua of the womb. We meet with ſeveral inſtances of the ſame thing in Rhodius, and in the memoirs of the *Curioſi naturæ*; inſomuch that Berger in his treatiſe *de Natura humana*, gives it as his opinion, that the only difference between *oviparous* and *viviparous* Animals conſiſts in this, that the former caſt their eggs out of the body, and lay them in neſts, and that their eggs contain all the nouriſhment requiſite for

We likewiſe ſee here an Unicorn's horn, as it is called, white as ivory, and ſpirally twiſted. This however, is not the horn of any land animal, but belongs to a kind of fiſh called a Narval, of which a deſcription has been given already.

In this fine collection there are ſeveral large pieces of ſilver ore, dug out of the mines of Norway in 1666, one of which weighs five hundred and ſixty pounds, and is valued at five thouſand crowns. Another piece, ſomewhat leſs, is valued at more than three thouſand; both being ſo rich, that they are reckoned to contain at leaſt three parts ſilver. They are compoſed of a whitiſh ſtone, the cracks or cavities whereof ſeem to be filled with pure virgin ſilver, which in ſome places lies in broad flat plates, and in others like pieces of fine ſilver-lace: but what is moſt admired in theſe pieces of ore are the threads or branches

for the *fœtus*; whereas in the latter the eggs are only detached from the ovary into the *uterus*, and have but little juice, the reſt being furniſhed by the mother.

On the other hand, we have inſtances of a crow, a hen, and other oviparous animals, producing their young alive and without eggs: nor is this all, for naturaliſts tell us of males, and even of men, that have voided eggs by the fundament; but we ſhall not tire the reader with accounts of this kind, which perhaps he may look upon as nothing but fiction.

of ſilver which ſhoot out an inch or two beyond the ſurface of the ſtone, appearing in the form of ſmall ſhrubs or buſhes; and ſeveral other ramifications of this kind are to be ſeen among the ſilver-ores preſerved in this Muſeum.

Here we alſo find ſeveral large pieces of Amber, ſome weighing forty or fifty ounces; which, upon opening the ditches about Copenhagen, when they fortified the city, were found ſticking to the ſides of old trees that were buried there, like the gum on the plum-trees in our gardens.

In the ſame chamber are a great many large branches of white and red Coral, and one of black; likewiſe a pair of ſtag's-horns growing out of a piece of wood in a ſurprizing manner.

Here is a human thigh-bone, three feet three inches long, as meaſured by Dr. Oliver himſelf*; and two very large ſcollop-ſhells, holding about three gallons each, and weighing two hundred and twenty-four pounds a piece. Theſe were brought from the Eaſt Indies; and it is ſaid the fiſh they belong to is of ſuch ſtrength, that if a man happens to get his arm or leg between the ſhells when they are open, it claps them

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* Whether the bone here mentioned did really belong to ſome human body of a gigantic ſtature, or to ſome elephant or other large animal, we ſhall not pretend to determine: But Sir Hans Sloane obſerves in the Philoſophical Tranſactions, No. 404. that ſeveral of theſe bones and teeth, which are kept and ſhewn about for the bones and teeth of giants, have been found, upon accurate inſpection,

ſpection, to have belonged to elephants or whales; from whence he infers, that others alſo, which for want of a ſufficient deſcription cannot be ſo well accounted for, moſt probably have belonged to ſome of thoſe large creatures. The pretended ſkeletons of giants, which have been dug up from time to time, Sir Hans likewiſe takes to be the ſkeletons of elephants or other huge animals, as ſeveral of them have actually proved to be upon examination. Of this kind was the large ſkeleton found near Trapani in Sicily, two others near Tunis in Africa, another near Krembs in Auſtria, and many more that might be mentioned; for as to Strabo's ſkeleton of a giant ſixty cubits high, and that of Pliny forty ſix cubits, they are undoubtedly fabulous.

Dr. Molyneux, Phil. Tranſ. No. 260, deſcribing a large Os Frontis of a man preſerved in the anatomical ſchool at Leyden, argues ſtrenuouſly for the exiſtence of giants; for as there have been dwarfs in all ages and countries, which have fallen ſhort even of half the common ſtature of mankind, ſome being not thirty inches in height, the Doctor thinks it not unreaſonable to imagine that nature may ſometimes act in the contrary extreme. Indeed, we have clear teſtimonies, ſays he, given us by authors of unqueſtionable credit and veracity, that there actually have been men in the world, and it is likely ſtill are, of ſuch a bulk and them together ſo forcibly as to cut the limb clear off.

A piece of marble is preſerved in this collection, which the Lutherans reckon a very valuable curioſity, the natural veins of the ſtone

ſtature as properly to deſerve the name of giants. Edmund Mallone, when his ſhoes were off, meaſured full ſeven feet ſeven inches in height; and Walter Parſons, porter to King James the Firſt, was much of the ſame ſtature. Diemerbroeck tells us he ſaw at Utrecht a man eight feet and a half high; Becanus ſaw a man near ten feet, and a woman that was full ten feet in height; and Thevet ſays he was ſhewn by a Spaniſh merchant the ſkull and bones of an American giant, whoſe height was eleven feet five inches.

Dr. Derham is of opinion, that though we read of giants before the flood, and more plainly after it, yet the common ſize of man was always the ſame from the creation, the giants ſpoken of in ſcripture being mentioned as rarities and wonders of the age, and not of the common ſtature. Inſtances of this kind we have had in all ages, beſides many fabulous relations, ſuch as we ſuppoſe that of Theutobocchus to be, who is ſaid to have been dug up in 1613, and to have been twenty-ſix feet high; and the ſtill more extravagant accounts of giants given us by Olaus Magnus. As for the inſtance of Goliah, whoſe height was ſix cubits and a ſpan, 1 Sam. xvii. 4. which according to Biſhop Cumberland is ſomewhat more than eleven Engliſh feet, of Maximinus the Emperor, who was nine feet high, and ſeveral others about ſtone running in ſuch a manner as to repreſent the exact figure of a crucifix. Some indeed have ſuſpected the repreſentation to have been by art; but upon the niceſt examination it appears to be entirely the work of nature *.

Amongſt the artificial curioſities, there is a ſkeleton made of ivory, two feet ſix inches high, in imitation of a human one; and it is ſo nicely formed and put together, that

about the ſame height; theſe are all to be matched, and even outdone, by modern examples, given us by Ludolphus, Magius, Conringius, Hakewill, and other authors; which laſt, from Nannez, ſpeaks of porters and archers to the Emperor of China fifteen feet high, and brings inſtances from Purchas of perſons ten or twelve feet high, and ſome exceeding that ſtature. But, it is probable the ordinary ſize of mankind was ever the ſame; which ſeems confirmed by monuments, mummies, and all other evidences of antiquity now remaining.

* Repreſentations of this kind by the veins of ſtones, and perhaps with the help of a ſtrong imagination, are frequently to be met with, particularly in the Florentine marble, wherein various figures, eſpecially the ruins of old buildings, appear in a very natural manner. A remarkable inſtance of this nature is to be ſeen in an Egyptian pebble, now in the Britiſh Muſeum, from one end of which a lapidary having ſtruck off a ſmall piece, obſerved to his great ſurprize, that the courſe of the veins repreſented a human face, and not

that one might eaſily take it for a natural ſkeleton.

There are likewiſe two crucifixes of ivory, and the whole hiſtory of our Saviour's paſſion beautifully expreſſed in a piece of carved work.

A ſmall man of war in ivory, with ſilver guns, is a curioſity much admired; as is alſo a watch made of ivory, with all its wheels and movements.

Beſides theſe there are many other curioſities in ivory, ebony, box, amber, and other materials, which are kept for the ſake of elegant workmanſhip: and we are told there is a common cherry-ſtone, on the ſurface of which are engraven two hundred and twenty heads, but their ſmallneſs makes them appear imperfect and confuſed *.

In

not only ſo, but the face of a particular perſon. The lineaments it ſeems, are exactly thoſe of our old Poet Chaucer, according to all the paintings we have of him; and this has ſo little of fancy in it, that every one who ſees the ſtone, if he ever before ſaw a picture of Chaucer, muſt remember the likeneſs.

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* Dr. Oliver tells us he did not ſee the cherry-ſtone here ſpoken of, but ſays that in Holland an Engliſh gentleman once ſhewed him a cherry-ſtone with a hundred and twenty-four heads upon it, and

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In this royal repoſitory we find ſix golden ſepulchral urns, which were diſcovered in the iſland of Funen in 1685, by a peaſant, as he was ploughing his land, and contained each of them ſome aſhes of a greyiſh colour. The largeſt of them weighs two ounces and a half, and the others two ounces and a dram. They are very thin, and each has three rings of gold about its neck, with ſeveral circles carved upon the outſide of the urn, having one common center. This diſcovery confirms the account given us by Olaus Wormius and other writers, that it was an ancient cuſtom among the northern nations to burn their dead, and then bury their collected aſhes in golden urns.

There is another ſepulchral urn of cryſtal, of a conical figure, which has alſo a gold ring about it, and was found near Bergen in Norway.

There are likewiſe in this collection ſeveral veſſels of different ſizes, ſome of glaſs and others of earth, which are called Lachrymal urns, or Lachrymatories, being uſed by the ancient Romans to catch the tears of weeping

and all ſo perfect, that the naked eye might diſtinguiſh thoſe of kings, popes, cardinals, &c. by their crowns and mitres. This curioſity was bought in Pruſſia for three hundred pounds, and is ſaid to have been the workmanſhip of a poor wretch in priſon at Dantzick.

friends, which were afterwards mixed with the aſhes of the deceaſed.

We ſhall conclude our account of this celebrated Muſeum with a deſcription of the Daniſh and Oldenburg horns, two curioſities which are much admired. The Daniſh horn is of pure gold, weighs a hundred and two ounces and a half, is two feet nine inches long, and holds about two quarts of wine meaſure. This horn was accidentally diſcovered in the year 1639, by a country girl, in the dioceſe of Rypen in Jutland; and is undoubtedly a piece of great antiquity, by the figures carved on the outſide, which ſeem to be hieroglyphics, devils, hobgoblins, *&c.* Perhaps ſome of theſe figures were deſigned to repreſent their deities, and the horn was probably uſed in ſacrifices, as amongſt the ancient Aſſyrians and other nations, who upon ſuch ſolemnities made a great noiſe with horns and trumpets, and uſed them to drink out of at their ſolemn entertainments.

The Oldenburg horn is of pure ſilver gilt with gold, weighs about four pounds, and is curiouſly enamelled with green and purple colours. The Daniſh antiquaries tell many fabulous ſtories of this horn, which are not worth repeating; and as to what they ſay of its being given to Otho, Earl of Oldenburg, in the year 989, it is plain it cannot be of that date, for the figures and characters on the outſide are modern; which, however, with the enamelling and other ornaments, are of excellent workmanſhip, and make it a very fine and valuable curioſity.

The cathedral of Upſal in Sweden, is reckoned the fineſt church in the whole kingdom. This church is covered with copper, and is adorned with ſtately monuments of ſome of the kings of Sweden, and other great perſons, whoſe remains were there depoſited. In the chapel behind the altar ſtands the monument of King Guſtavus in marble, between the ſtatues of his two wives, who are likewiſe there interred: and in another chapel is the tomb of King John's wife, who was the mother of Sigiſmund the Third, King of Poland. It is of white marble, and of excellent workmanſhip, which may alſo be ſaid of the other monuments in general.

The cathedral of Lunden is a magnificent ſtructure, and has a very lofty ſpire, which ſerves as a mark for ſailors, being ſeen at a great diſtance. The altar of this church is a beautiful piece of work; but what moſt engages the attention of a ſtranger is its curious clock, which for the number of its movements and figures may vie with thoſe of Lyons and Straſburg. Every hour two horſemen come out and encounter, and a door opens, which diſcovers the Virgin Mary ſitting on a throne with Chriſt in her arms, and the

Magi with their retinue marching in order and preſenting their gifts, two trumpeters ſounding all the time of the proceſſion. This clock, beſides the hour, ſhews the month and day, and every feſtival throughout the year.

SECT. VI.

Curious Remains of Antiquity in Denmark, Norway, *and* Sweden; *remarkable Cuſtoms of the Inhabitants; with a ſummary View of the moſt extraordinary Revolutions among them.*

REMAINS *of* ANTIQUITY, *and* REMARKABLE CUSTOMS.

WITHIN a few miles of Sleſwick in Denmark are ſtill to be ſeen, in ſeveral places, the ruins of a famous wall, which was built by the Danes to prevent the incurſions of the Saxons. It is thought to have been begun by Gothofred, king of Denmark, about the year 808, and to have been afterwards improved by Queen Thyra and other Daniſh monarchs. This rampart was called Danewark, and like the Picts wall in Great Britain, is reported to have reached from ſea to ſea, quite croſs that part of Jutland.

At Hollen in Norway, about fifteen miles from Tonſberg, there is a remarkable church, which is cut out of a rock, and has a burying-place on the top of it. It is undoubtedly very antient, and perhaps, as Olaus Wormius ſuppoſes, was originally a heathen temple.

On the tops of the hills, in the iſland of Sylt, near Sleſwick in Denmark, are found urns of a black earth, full of aſhes and human bones; whence may be inferred, that the antient inhabitants of theſe northern countries buried their dead like other nations of antiquity.

The inhabitants of Lapland are, in many reſpects, a very remarkable people, and far different in their manners and cuſtoms from other nations of Europe. With reſpect to their ſtature, they are the ſhorteſt men in all the north, being ſeldom above four feet and a half high, and ſome of them even under that ſize. Their aſpect is generally homely, having a large head, hollow eyes, a broad face, a flat noſe, and ſhort black hair. They have broad breaſts, ſlender waiſts, and ſmall legs, but are very ſtrong, ſwift, and nimble. The women are ſomewhat handſomer than the men, having black eyes, and a complexion mixed with a natural red and white, which is not diſagreeable. They are ſuperſtitious, timerous, and paſſionate, and have only confuſed notions of Chriſtianity; but they are charitable and hoſpitable to ſtrangers. Hunting and fiſhing are their chief and almoſt only employments.

The fleſh of the rein-deer, their milk, the cheeſe they make of it, and the fiſh they take in their ſeas, lakes, and rivers, are the principal part of their food. Brandy, and other ſpirituous liquors, they are very fond of; but their uſual drink is water, of which they have a kettle a kettle always over the fire in winter; and they alſo drink the broth of fiſh and fleſh boiled together. In ſummer they wear a cloſe garment made of coarſe wool, of a light grey colour without dying, which reaches down to the middle of their legs; and round them they wear a belt or girdle, at which hangs a knife, and a pouch, wherein they keep their flint, matches, tobacco, &c. Their winter cloaths are the ſkins of rein-deer with the hair inwards, of which they alſo make ſhoes, boots, caps, and gloves; and the nerves of the animal ſerve them for thread. The women's apparel is not much different from that of the men; but they have more trinkets hanging to their girdles, ſuch as chains, rings, knives, a needle-caſe, &c. weighing ſometimes twenty pounds.

The habitations of the Laplanders are rather huts than houſes, conſiſting of pieces of timber or rafters joined together, and covered with turf, or the branches and bark of pine-trees. They have no chimneys, but a hole at the top of the hut, which ſerves to let out the ſmoke, and to admit the light. In ſome parts of the country they build their ſtorehouſes on trees, to ſecure their proviſions from bears and other wild beaſts.

The Laplanders, in hunting, make uſe of bows about three yards long; in handling of which they are very dextrous, being trained up to it from their infancy; inſomuch that ſome of them will ſhoot an arrow into a circle no bigger than a farthing, at ſuch a diſtance as they can but juſt diſcern it. For the larger ſorts of beaſts they ſometimes uſe fire-arms and ſpears, or dig pits for them to fall into: others they take in traps, catch them with dogs, or kill them with poiſonous baits. They account the fleſh of the bear a great rarity; and he that kills one is diſtinguiſhed by laces round his cap, wrought with tin wire; on which occaſion they make great feaſting.

When a Laplander has a mind to marry, he looks out for a young woman poſſeſſed of a great many rein-deer, in which the riches of theſe people chiefly conſiſt; and it is the cuſtom for parents to give their children ſome rein-deer as ſoon as they are born, which, with all their increaſe, belong to them ever after. The more of theſe animals a maid has, the ſooner ſhe may expect a huſband; for the Laplanders do not much regard beauty or other qualifications. As to the poorer ſort, they are content to marry a man's daughter who lives in a convenient place for fiſhing and hunting.

When the ſuitor goes to pay his firſt viſit to the woman he intends to marry, he is accompanied by ſome of his friends, one of whom is to negotiate the matter, and carries with him ſome bottles of good brandy or other ſpirituous liquor. Being arrived at the hut, they are all invited in, except the ſuitor, who ſtays without for ſome time, till the company have drank round, and his friend has made the propoſal to the young woman's parents. The man is then called in, and takes a dram or two with the company, but without ſeeing the girl, who in the mean time is ſent abroad. If the father conſents that the young man may pay his reſpects to his daughter, he goes out of the hut to his ſledge, puts on his beſt apparel, and returns to ſalute his miſtreſs with a kiſs; after which he makes her a preſent of a rein-deer's tongue, and ſome other trifles, which ſhe refuſes to receive in the preſence of her relations, but going out of the hut with him, ſhe accepts them. The lover then deſires her to let him ſleep near her in the hut; which if ſhe grants, the marriage is as good as concluded; if not, ſhe throws the preſents on the gronnd, as a mark of her refuſal. After marriage, the bridegroom is obliged to ſerve his father-in-law a year, before he takes away his wife and her patrimony of rein-deer; at which time all the friends make preſents to the new-married couple.

Soon after a child is born, they waſh it with ſnow or cold water, and then wrap it up in the ſkin of a hare. The women do not keep their bed above four or five days, and as ſoon as they have recovered ſtrength, they ſet out with the child on their back, to have it baptized; for which purpoſe they are often obliged to take long journies. Their cradles are made of a piece of hollow timber, like a ſmall boat, in which the child is laid on a kind of ſoft fine moſs, and covered over with the tender ſkin of a young rein-deer. The cradle is ſuſpended by a rope from the roof of the hut, and by toſſing it to and fro they lull the child to ſleep.

The Laplanders have no phyſicians among them, nor indeed have they much occaſion for any, as they are very ſeldom afflicted with ſickneſs. For the cure of all inward diſtempers they make a drink of a certain moſs, which they call Jerth, or inſtead of that chew the root of angelica, or boil it in rein-deer's milk. When they feel a pain in any part of their body, they take a kind of fungus, or muſhroom, growing upon the birch-tree, and having ſet fire to it, they apply it burning hot to the part affected; and this occaſions a bliſter, which they imagine draws off all the bad humours. For wounds they have no other remedy but the reſin that oozes from the fir-tree; and when they have any member frozen, they run a red-hot iron into a cheeſe made of rein-deer's milk, and with the fat that drops from it anoint the part, which by that means is almoſt inſtantly cured.

As to their funerals, if a deceaſed Laplander was rich, his corps is wrapped in linnen; but if he was poor, he has only a woollen ſhroud. They put into the coffin, along with the deceaſed, a flint and ſteel and a hatchet, which they imagine he may have occaſion for in his journey to a place of reſt. But this is only the practice of thoſe who are ſtill heathens, or have very groſs notions of the Chriſtian profeſſion. The corpſe is drawn in a ſledge by a rein-deer to the place of burial; after which the creature is killed, to make a funeral entertainment, to which all the friends and relations of the deceaſed are invited.

Many ſtories are told of the wizards or conjurers of Lapland, who pretend to foretel future events, and are thought to have a power of inflicting diſeaſes on whom they have a mind; on which account they are held in great veneration by the poor ignorant Laplanders, who take all imaginable care to avoid their anger.

END OF VOL. VIII.

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